

Many casualties in public house blast at Caterham

People were seriously hurt in an explosion at a public house at Caterham, Surrey, last night. Police said the remains of a suspected paragon and public house in the area were evacuated.

Confrontation between the Government and the Protestant majority in Northern Ireland is inevitable if Westminster rejects the constitutional Convention's final report, Mr Rees, the Secretary of State, was told by "loyalist" politicians yesterday.

Suspect package found in social club opposite

Police said that the explosion, thought to be caused by a bomb, had occurred in the ground floor of the public house at Caterham last night. At least 10 people were seriously injured and many others, including soldiers, were hurt. The explosion, at about 11.30 pm, was at the public house, which is a public house, and is among soldiers based in the barracks. Several men of the 1st Welsh Guards, were the injured.

The suspect parcel was found in St Lawrence's Club, opposite the Caterham Arms. A witness said that most of the injured appeared to be guardsmen or their girlfriends. Last October, military establishments throughout Britain were told to tighten security as police searched for an IRA "active service squad" believed to be responsible for planting bombs in two public houses in Guildford, Surrey. The explosions killed five people and injured 65, including 43 army staff from camps near by.

The Caterham explosion was the first bombing in Britain since January, when six bombs went off outside buildings in London and Manchester. It was the first public house bombing since the two Birmingham public houses were wrecked in November last year and 21 people died.

Loyalists' say clash is inevitable

Mr Rees, Secretary of State, said that the Convention was inevitable if the Government's final report was by Westminster. He said that the Convention was inevitable if the Government's final report was by Westminster. He said that the Convention was inevitable if the Government's final report was by Westminster.

In the loyalist coalition Vanguard members have the closest connections with armed Protestant paramilitary groups. The politicians yesterday left Mr Rees to say that they would quickly be out on the streets in the event of the report's being rejected.

Convention has drawn up its report, Mr Rees said. "I have given a great deal of thought as to what we might do after that. We could put ideas forward ourselves which the Convention could look at. Also, under the law, there is room for a plebiscite on the matter."

National Institute calls for early reflationary measures

By Tim Congdon

The "startling nature" of recent developments in output and employment calls for early, but modest reflation, the National Institute's Economic Review says today. This is necessary to counter weak demand, declining production and an "unexpectedly deep and extensive recession".

The Institute has revised sharply downwards its forecast for the level of economic activity. In its May Review it was expecting a 1.6 per cent rise in gross domestic product this year; in its present review it is expecting a 1 per cent fall.

The forecasts are presented with greater caution about the possible range of error than usual. The severity of the present recession is almost unprecedented in the post-war period and casts doubt on the trustworthiness of relationships estimated for most stable periods, the institute adds.

Some moderation of unemployment would improve the reception given by the trade union movement to the pay policy, the institute suggests, it challenges "much current comment which assumes that the present and prospective unemployment levels reinforce the policy".

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Mr Stonehouse speaking to reporters outside Brixton prison after his release last night. He criticised the bail system.

Mr John Stonehouse is released on bail

By Martin Huckerby

Mr John Stonehouse, MP, left Brixton prison on £40,000 bail last night after spending 80 days in custody in Australia and Britain. After his release he spoke of the "iniquities of the bail system".

He had been granted bail of £10,000 in his own recognizances at Bow Street Magistrates' Court yesterday morning, but was returned to Brixton because his lawyers could not find two additional sureties of £15,000 each immediately.

Mr Michael O'Dell, Mr Stonehouse's lawyer, who said the granting of bail had come "as a complete and utter shock", set about raising the sureties in time to beat the 10 pm release deadline at the prison.

Mr Stonehouse said later that he expected his husband to address the Commons soon after the hearing, and would also want to meet his constituency party in Walsall, though she was not sure whether they would want to see him. There were indications from the constituency yesterday, however, that a meeting might be arranged.

Negatives of Fellini's new film are 'kidnapped'

From Patricia Clough

Master negatives of three important films under production have been stolen and the producer, Federico Fellini, hopes that it is no more than a new type of "kidnapping".

Eighty-six reels, including part of Federico Fellini's *Casanova*, Pier Paolo Pasolini's *Il Deserto di Salsola* (120 Days of Sodom) and most of Damiano Damiani's *Un Giorno di Genio* (One Genius) have disappeared from the Technicolor processing plant in Rome.

Haile Selassie's son demands an inquiry into the causes of his father's death

By Our Foreign Staff

Haile Selassie, former emperor of Ethiopia, who was deposed in a military coup on September 12 last, was found in his sleep in Addis Ababa yesterday aged 83. A statement by Ethiopia radio said that he died of an illness after a prostate gland operation two months ago.

His son, Crown Prince Asfaw Wossen, in a statement issued in London where he is living in exile, accused the ruling military authorities of refusing to allow the former emperor to be cared for by his family after his operation. He had been kept isolated from his friends and family since his deposition, and the claim by the government that no physician could be found when he was taken ill on Tuesday was "beyond credibility".

Prince Asfaw Wossen demanded a post mortem examination by international doctors and the Red Cross. Reports from Addis Ababa said that the reaction of Ethiopians to the death of the former emperor was unemotional.

Five days ago, Haile Selassie's daughter and grand-daughter were allowed to visit him because of his failing condition, reports from Ethiopia said.

Ion Romania on the front

There is to be a meeting in Romania from 6 to 18, it was announced. The Prime Minister, Ceausescu, will be the first visit to the Second Prime Minister, but Mr Wilson has been asked to be the first.

Warning of risk to mankind in space shots

Hidden dangers in the search for life in other parts of the universe were suggested by Sir Bernard Lovell, the radio astronomer, last night. Giving his presidential address at the opening of the annual meeting of the British Association for the Advancement of Science, Sir Bernard urged scientists and technologists to re-examine their responsibilities to society.

Sinai accord held up by technical details

The proposed Sinai agreement is being held up by "technical problems", but apart from these Dr Kissinger, the American Secretary of State, is thought to have a draft generally acceptable to both Israel and Egypt.

Rhodesia warning

Bishop Muzorewa, the Rhodesian nationalist leader, yesterday warned tribal chiefs against negotiating with Mr Smith, the Prime Minister, now that the constitutional talks had broken down. It was "playing with fire", he said.

Pearl raising motor premiums by 17 pc

Pearl Assurance is again increasing its motor insurance premiums from October 1 and may move towards quarterly premium adjustments. Pearl last increased rates in June by 14 per cent and now plans a 17 per cent rise.

On other pages

Leader page, 15
Letters: on university finances from Professor David Lowenthal and Professor A. M. Ross; on agricultural tied cottages from Mr Montague Keen
Leading articles: No early reflation; Haile Selassie: Mice-makers of Munich
Aix, page 11
Irving: Wardle on *Pilgrim* and William Maun on the LPO with Gollini, both at Edinburgh Festival
Charles Lewsen on *Happy End* (Lyric Theatre); Alan Coren on *Oil Strike North* (BBC)

Furniture adds to teacup storm

As anger grew among MPs over the £20,000 House of Commons Order for German chinaware, a report from the Commons Services Committee yesterday disclosed accelerating losses in the refreshment department of the House.

Task for press inquiry

The Royal Commission on the Press is to investigate industrial relations in national and provincial newspapers.

Valera

Mr de la Riva, President of the Republic, is 92, was causing much trouble yesterday afternoon. A Talbot Lodge, the home at Black, in where he lives, had been suffering.

Tax laws outcry

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HOME NEWS



Judging for the best giant bloom at the National Dahlia Society show at Westminster yesterday. Report, page 16.

Press inquiry to look at labour relations

By Paul Routledge
Labour Editor

Industrial relations in the national and provincial newspapers industry are to be investigated by the Royal Commission on the Press under the chairmanship of Professor Oliver G. Clegg, head of the Department of Sociology at the University of Manchester. The commission has asked the Advisory Conciliation and Arbitration Service to undertake a long-term inquiry into the industry's labour disputes. The study is expected to take up to a year to complete.

Arbitration officials, who have had many contacts with the industry since service began operating a year ago, will consult employers and unions in an effort to set the roots of labour difficulties. The most pressing of these was frankly admitted yesterday by a senior official of the leadership printing union, the National Graphical Association.

Mr Joe Wade, its assistant general secretary, said in his interview that the union could be grasping the nettle of arbitrating in national newspapers. He added: "It would be a brave man who would attempt to assess the amount of arbitrating in Fleet Street. It would be a foolish one to deny it existed."

"So, has not the time come for realistic discussions between the unions and newspaper publishers' Association?" asked the commission. "The management of manning and change technology before we are faced with an Othello situation somewhere else? There is doubt in my mind that a combination of manning and the introduction of

new techniques are not only necessary but feasible."

Mr Wade, who represents Fleet Street's printing craftsmen, argued that those objectives could be achieved without compulsory redundancies. If there was "realism and good will" on both sides, he added: "There is not much time left if we are to avoid the closure of one or more national newspapers and the large-scale redundancies that would follow. Unless we are prepared to grasp this nettle there is little or no chance of securing the financial assistance from the Government which will be necessary if Fleet Street is to make the transition from Caxton to computer."

Turning to the fortunes of the newspaper's management, Mr Wade criticized the newspaper's management for its "quite arbitrary" ultimatum that the paper would cease publication unless nearly a third of its staff were made redundant.

Whether it would succeed against the present background of economic recession and falling circulation remained to be seen.

Conclusions welcomed: Mr John Dixey, director of the Newspaper Publishers' Association, said: "No one who cares for Fleet Street and is committed to the objective of maintaining the same number of national newspaper titles into the foreseeable future can possibly quarrel with Mr Wade's conclusions in the Press Association report."

Anyone who knows the Fleet Street scene—and that includes especially all employees of national newspapers—recognizes that the present number of people employed on national newspapers must reduce."

Journalists seek pay for period of stoppage

By Christopher Thomas
Labour Staff

Discussions on back pay for more than two hundred journalists who were dismissed seven weeks ago at the Birmingham Post and Evening Mail were adjourned last night without a settlement.

The management said later: "When people break their contracts of employment, and in consequence are no longer employed, it would be a principle of vast importance for every industry if the management conceded that they should still be paid. That would be getting towards the Marxist philosophy that strikes must be self-financing."

A conditional agreement was reached to go to arbitration under the guidance of the Advisory Conciliation and Arbitration Service on the question of back pay. But the office branch of the National Union of Journalists first wants management assurances about staff levels and future redundancies.

Originally, 250 journalists were dismissed for meeting during office hours and disrupting production in a dispute over pay. Some have since found other jobs and others have retired early and union officials estimate that the number has dropped to about 230.

Production of the Birmingham Post and Evening Mail was disrupted yesterday for the second day over rejection of a pay and conditions claim by members of the National Graphical Association. About 100,000 copies were lost.

'Mastermind' winner for 'Supermind'

By Our Arts Reporter

Competitors in the BBC's Mastermind programme which returns to television next week, will have the added incentive this year of an extra trophy, the "Supermind" award.

As it is the fourth year of the contest (the first three were won by women) there will be an additional programme bringing all four winners together, and that will take place at the end of the series.

After the last series 2,500 people applied to take part this year. They include an émigré Russian, an American at Oxford, 13 teachers, a lorry driver, a miner, a barrister, a factory hand, two priests and a sheet metal worker.

Other subjects range from Athens in the fifth century BC to British steam locomotives. Of the 350 who applied, 350 were selected for auditioning. The

48 contestants will appear in 17 programmes beginning next Thursday.

Last autumn the programme attracted audiences as large as those for popular drama and comedy series. The rules are as before: questions on specialist subjects followed by a general knowledge round.

Those who reach the finals will have to find a second specialist subject. The new crystal glass bowl with the Nine Muses etched on its surface, with crystal glass goblets for the runners-up. For the "Supermind" another piece of glass has been commissioned.

Brain of Britain: Miss Winifred Lawson, a retired teacher, of Sellywood Road, Bournville, Birmingham, yesterday won the final of BBC Radio Four's national contest Brain of Britain 1975 (the Press Association reports).

Russian child in heart operation leaves hospital

Irina Chudnovskaya, aged nine months, the Russian child who had a "blue-baby" heart operation in London, left Brompton Hospital, Chelsea, yesterday. Her condition was very satisfactory.

A doctor said that although she was able to fly home to Leningrad she would remain under the care of the London area until Mr. Christopher Lincoln, the consultant who performed the operation, returned from Brazil shortly and saw her.

She is the first Soviet child to benefit from the Anglo-Soviet health agreement signed by Mr. Wilson and Mr. Kosygin in Moscow in February.

When she was flown to London with her mother on August 8 for the operation her life was in danger. Her heart defect meant that she suffered from a lack of oxygen, which made her blue.

Mrs. Galina Chudnovskaya, aged 28, her mother, is married to a physician. They have another daughter, aged five.

Mrs Thatcher to visit oil rig

Mrs Thatcher, Leader of the Opposition, will inspect a North Sea oil rig during a four-day visit to Scotland early next month.

She will fly by helicopter to the exploration rig Sea Quest about 150 miles off the Aberdeenshire coast and will fly over production platforms in BP's Forties field.

Clearing rubbish cost £190,000

The troops who cleared the streets of Glasgow after the dustcart drivers' strike earlier this year will cost local ratepayers £191,912, the district council cleansing committee was told yesterday that the bill included manpower and vehicles.

The 1,200 troops worked in the city's streets for three weeks, clearing heaps of refuse.

Channel attempt fails

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Help urged for prisoners facing jail discipline charges

By a Staff Reporter

Prisoners facing disciplinary charges should receive help in preparing their defence as an experiment in three or four prisons, a Home Office work-party recommended in a report published today.

The working party on adjudication procedures in prisons agrees that in disciplinary cases the prisoner's defence is often weak. It suggests that a "prisoner's friend" should be appointed as a "prisoner's friend" in disciplinary proceedings.

Dr Harris suggests instead that a member of the board of visitors should be appointed as "the prisoner's friend" in disciplinary proceedings.

WEST EUROPE

Swedish MPs call for law reform after disclosures that the rich legally avoid huge tax demands

From Roger Choate
Stockholm, Aug 27

Authoritative diplomatic and political sources said today that Sweden's Social Democratic Government appears to have sailed into politically troubled waters after disclosures that some leading citizens pay very low income taxes by exploiting legal loopholes.

More than a hundred Members of Parliament representing all five parties today demanded immediate tax reform after reports by national newspapers. The reports have been confirmed by tax authorities and high Government sources as carefully researched and accurate.

Tax authorities confirmed that many people, such as Mr John Mattson, the country's highest gross income earner, were able to deduct from his gross income all renovation costs, as well as interest on building loans and other expenses. He lives in the building where he lets flats whose rents have been increased.

On his 1974 gross income of 250,610 kronor (about £27,000) he thus deducted 181,936 kronor before arriving at a taxable sum. Mr Strangé paid low taxes in 1973 and 1972 by using the same exemption device.

Mr Mattson, a construction magnate, had a 1974 gross income of nearly 9m kronor (about £1m), tax officials said. He deducted more than 6m kronor before he was liable for taxation. Mr Henning Sjöström, one of the country's wealthiest and most socially prominent lawyers, declared a 1974 taxable income of 25,500 kronor, tax officials said.

During the disclosures the mass circulation newspapers Aftonbladet and Expressen invited readers to telephone and give their reactions. Thousands of angry Swedes are said to have done so.

None the less, they said, ordinary Swedes groan under Western Europe's most sternly progressive income tax rates which seldom permit average wage earners to make generous pre-tax deductions.

It has come as a shock for them to learn that Mr Strangé,

an architect of the system and a pillar of the long ruling Social Democratic Party, last year paid about £3,500 in taxes on a gross income of about £27,000. This was disclosed by tax officials and Mr Strangé himself.

The sources agreed that Mr Strangé and the Social Democrats appear to be embarrassed because the socialists, who have ruled Sweden for 44 years, recently championed a "through solidarity" and are publicly committed to narrowing income gaps.

The Social Democratic newspaper Aftonbladet of Stockholm, which chided Mr Strangé, said the Finance Minister, who is 67, acquired an apartment building in 1970 in Stockholm's exclusive Old Town district.

It needed renovation and he was able to deduct from his gross income all renovation costs, as well as interest on building loans and other expenses. He lives in the building where he lets flats whose rents have been increased.

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ried with two children he pays about twice as much in local and national taxes in a country with Europe's highest prices.

Stiff taxes are even levied on foodstuffs, which has resulted in a brisk trade in dog and cat food among pensioners, according to the Social Welfare Ministry.

Mr Olof Palme, the Prime Minister, today broke his silence after eight days of huge headlines and defended the Finance Minister, who has been in Swedish Cabinets since 1945. Mr Strangé, he said, was an upright, honourable and honest man, a statement which no one in Sweden would dispute. Mr Palme declined to comment on whether it was politically wise for a socialist Finance Minister to avail himself so freely of the deduction system.

But, Mr Palme added, the system had been abused by the very rich and should be reviewed.

Mr Gunnar Helen, the Liberal Party leader, said he believed the tax system was inequitable and favoured the rich.

Mr Erik Brandt, Social Democratic chairman of a parliamentary tax commission, said the system must be overhauled at an early date. He said some high income earners apparently had devised ways of deducting almost their entire incomes.

Mr Strangé did not dispute the accuracy of newspaper reports but defended his deductions. He said in a written statement that the apartment building he owned was in such bad shape when he bought it, that he was forced to spend large sums to renovate it so that his tenants could live comfortably.

Renovation costs, as well as interest on loans, were tax deductible, he noted. "The Finance Minister is also permitted to make pre-tax deductions," he added.

He denied that the building had greatly increased in value as a result of renovation. "The reverse is true," he said.

Developing nations' need for teachers

From Tim Devlin
Education Correspondent
Geneva, Aug 27

The developing nations will still be unable to provide education for all their children of primary school age in 1985, Unesco's thirty-fifth international conference on education was told in Geneva today.

Projections prepared by member states showed that, if present trends of 67 per cent

of the six to 11 age group in schools, Africa 44 per cent, and Latin America 75 per cent in 10 years' time.

Opening the conference, attended by 400 delegates from 80 countries, Mr Amadou Mahtar Mbow, director-general of Unesco, referred to the impossible task confronting countries that in some cases would have to triple the number of teachers to provide education even for this age group.

In 1985 only about a third of the next age group in Asia and Africa would be attending secondary schools and just over half in Latin America.

Dr Amadu Ali, federal Commissioner of Education for Nigeria, said that 25 per cent of his country's six-year-olds were at school at the moment, but the republic was witnessing "a phenomenal growth which had been met with a corresponding call for educational provision."

Combined effort sought to aid single homeless

By John Chatteris

The 10 borough councils in Greater Manchester Metropolitan County have been asked to establish a joint committee to provide for single homeless people in the biggest population concentration outside London.

The Greater Manchester campaign for the Homeless and Councils (GMC) has sent copies of its report on local government and responsibilities for single homeless people to the councils, and a meeting with Manchester Association of Metropolitan Authorities.

Some boroughs help more than others, the report says. In some there are greater numbers to house, so it would be "if all the boroughs worked together. Char said yesterday that since the report's circulation confidentially a month ago none of the rough councils had questioned its findings.

Voluntary organizations provide most help for the single homeless in Greater Manchester, the report says, where the Government usually does nothing.

It says the former Salford City Council and some of the former Lancashire County Council areas aggravated the situation by refusing to house the fathers of homeless families. Manchester city was an example of insufficient council provision for single people, with 38 per cent of those on the waiting list wanting one-bedroom accommodation, but only 14 per cent of the housing stock fitting that category.

Empty houses owned by local authorities should be offered to voluntary organizations for management.

Cabinet leaflet misleading, Mr Whitelaw declares

By Our Political Correspondent

The Government's pamphlet on its counter-inflation policy was in one respect a misleading document, Mr Whitelaw, deputy leader of the Conservative Party, said last night.

"Pay restraint cannot be itself amount to a counter-inflation policy, as is now widely recognized. This Labour Government has been and is being profligate in spending our money, taxpayers' money. Public expenditure has got to be cut, and cut severely, if the attack on inflation is to succeed."

It was both silly and counter-productive for the Government to pretend otherwise: "If only

this Labour Government would give priority to its own house-keeping, the people of this country would be that much more ready to respond to their call for national support."

Cutting back on government spending would be painful but it had to be faced. The people would respond only if the Government had the courage to tell the unvarnished truth about its intentions. "The economy by stealth will lead only to resistance and resentment."

"As in Mr Wilson's broadcast last week, the Government has missed an opportunity in this leaflet of telling the people the whole truth."

AUEW chief's call to back £6 pay limit may fail

By Tim Jones
Labour Staff

Mr John Boyd, general secretary of the Amalgamated Union of Engineering Workers, who is regarded as a moderate, has called on his members to co-operate with the Government in its counter-inflation policies.

His call, in the latest edition of the union's journal, is unlikely to sway AUEW delegates to the TUC congress at Blackpool next week. They firmly oppose the policies, and intend to use their 1,400,000 block vote against the proposed £6 flat-rate pay increase. The Technical, Administrative and Supervisory Section (TASS) branch of the AUEW has a motion down specifically rejecting any income policy based on wage regulation.

But Mr Boyd writes: "No one in Britain can contract out of his personal responsibility to make a contribution to our nation's recovery. We must be builders, not demolition experts in the present crisis."

He will underline his views at the TUC General Council meetings today and tomorrow in Blackpool. It will be his last opportunity to try to influence the labour movement's top policy body. In June, the union nominated Mr Reginald Birch, a Marxist, to replace him.

The decisions by the TUC and the Labour Party conference must be progressive, Mr Boyd says.

But such decisions must be symptomatic of the thinking and feelings of the people, particularly trade unionists.

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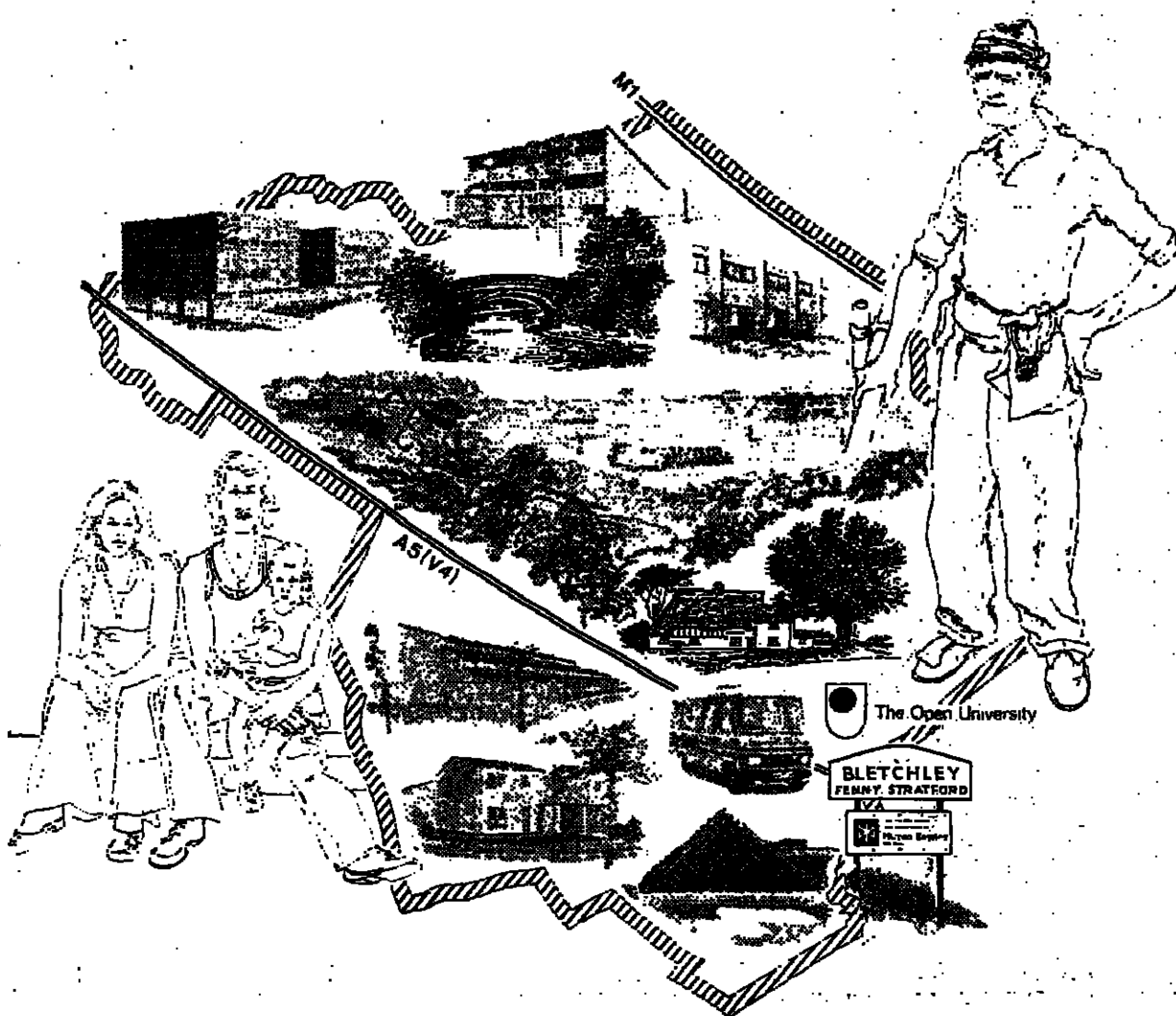
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Milton Keynes



Frances Dalry

Milton Keynes, when completed, will be easily the largest new town in Britain. It may also be the last. Although some enthusiasts may like to see it as the first in a second generation of new "cities", built on an altogether grander and more exciting scale than Stevenage or Hemel Hempstead, it is more likely to be the climax of an era.

Conventional wisdom has it that the new towns are one of this country's few important successes since the Second World War. Economically that is certainly true of the older towns, mostly clustered around London, socially and aesthetically their success is more questionable.

But the long debate about whether to go ahead with a new town in central Lancashire, originally conceived on much the same scale as Milton Keynes, and the recent decision to reduce the growth targets for Telford are signs that government planners are revising their ideas.

Experience with new towns in Scotland, the north-east and Lancashire has not been

to areas where jobs are needed, however juicy the carrot. Critics say that they attract investment away from older industrial cities and hasten their decline.

It is argued that the population "explosion" is over, that we cannot afford the continuing loss of agricultural land, that priority should be given to rehabilitating and renovating the many decaying industrial areas and making them attractive places to live and work in, and that it makes better economic sense to expand towns like Northampton and Peterborough than to start from scratch on a green field site.

However, Milton Keynes is, and always will be, something special. For one thing, although near its best

late a depressed region, clear up dereliction or arrest depopulation, it is rather as if the planners had studied a map of Britain and pinpointed the site best guaranteed to ensure success.

It lies about half way between London and Birmingham, close to the M1 and bisected by the A5. It is on the main railway between London and the North-west, and is to have a new station, the first to be designed specifically for the Advanced Passenger Train. All it lacks is the third London airport, which might have been built at Wing nearby.

There is no question of the Government having to direct or persuade firms to move to Milton Keynes. Being within the South-east region, although near its spoken-recognition that the

everywhere else in the region and, paradoxically perhaps, has to fight for its industrial development. The appeal of new towns lies in the escape they provide from the squalor and the chance to live and work in clean open surroundings. It is the worst sort of arrogance to imply that such conditions are wrong for the "workers", that a pleasant and even excellent environment is somehow corrupting.

Mr Fred Lloyd Roche, the development corporation's youthful and articulate general manager, is in any case well aware of the danger of being thought elitist, even if the accusation is unjustified. "We must cater for a full social range, and that includes things like housing for single-parent families," he says.

"As for the physical en-

contribute to the impression that it will be somehow superior to other new towns. In a recent issue of the Architectural Association, the nearest thing we shall get to Utopia. It will be an 'instant' city, urbanized almost overnight by the amalgamation of the many small and delightful villages, transfused by such organizations as the equally instantaneous Open University, and already compounded by a growing community of some 15,000 people."

Presumably he meant new-comers at the time of writing, since the original population numbered some 40,000 and has already grown to about 65,000.

In the same issue, Mr Robert Maxwell, senior lecturer in architecture at University College, London, suggests that Milton Keynes is French rather than English in inspiration. "The road becomes a boulevard, is long and straight and is regularly lined with trees and with parked cars," he writes.

"The result, as with the magazine *Marie-Claire*, is to project an aura of bourgeois calm. Critics who had already denounced the new town as being over-committed to the private car and private choice will no doubt take the designs for the centre as further proof that the city will effectively become a middle class ghetto."

But, as Mr Maxwell goes on to point out, that kind of response is facile. The appeal of new towns lies in the escape they provide from the squalor and the chance to live and work in clean open surroundings. It is the worst sort of arrogance to imply that such conditions are wrong for the "workers", that a pleasant and even excellent environment is somehow corrupting. Mr Fred Lloyd Roche, the development corporation's youthful and articulate general manager, is in any case well aware of the danger of being thought elitist, even if the accusation is unjustified. "We must cater for a full social range, and that includes things like housing for single-parent families," he says.

Creating a sort of planned suburbia. But suburbia is not necessarily a dirty word. There are many things about it which people find delightful. Certainly there is much to admire in the models displayed at the corporation's offices. The city centre, now in the first stages of construction, with its grid-iron pattern of broad tree-lined boulevards and its spacious, unoppressive shops and offices, is unlike anything else in Britain. The overall plan is also remarkable for its lack of rigidity.

It is far too soon to judge whether Milton Keynes will fulfil its high promise. Some of the more ambitious schemes may fall victim to economic pressures. The proportion of public to private housing is about 75 per cent to 25 per cent, which is higher than Mr Roche and his colleagues would like. Much of it has been built in a hurry, and looks it.

The intention was that every house should be built on the assumption that it might one day be offered for

sale, but present policy forbids a "rotation-owned" system. Pressing on, the town is also bound to

little reason to Milton Keynes. However, its advantage is that it has no germs that could not make commercial use of it. Mr Roche says that by the time you will have over the place, but trees

Many people are swallowing thousands of acres of countryside, an area of pretty like Stony St. modern community quarter of a But at least, deliberate mistakes should be made. Mr Roche says that by the time you will have over the place, but trees

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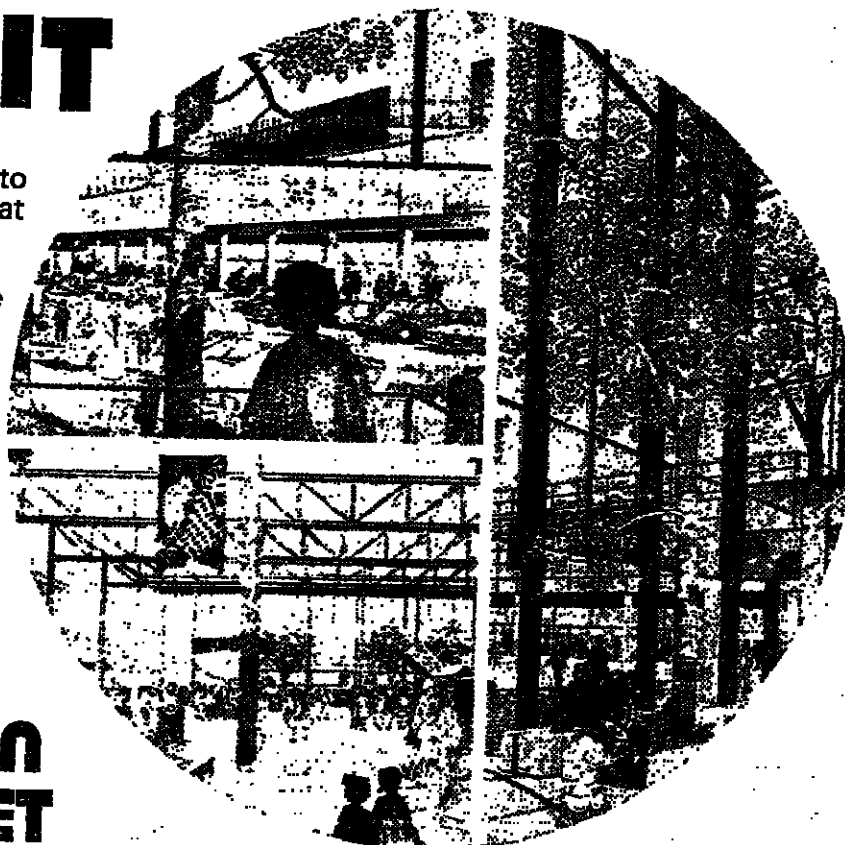
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University grows more open

by Robin Mead

Six years ago, the dream of Timothy Boutwood, a Luton carworker, started to come true. While driving around here,

Perhaps this is the university's fault. After six years' considerable achievements, the OU campus seems to have a strangely insular attitude. Because there are no students, apart from a handful of postgraduates, on the site to enliven proceedings and widen local contacts, town and gown seldom mix.

The visitor to the site can be made to feel like an intruder and tours appear to be perfunctory. Although there are events and facilities which are open to the public, the public at large often seem to be in ignorance of this.

It is to be hoped that things will change. Mr Ray Thomas, head of the university's New Town Study Unit, explains that housing for workers at the university has only recently become available in Milton Keynes.

Before that, academics and clerical workers alike either commuted from London or other major cities, or else bought property away from the town. "This severely limited the contribution the OU made to local affairs," he says.

"It is also true that the area has a distinctive personality and people round here like to do their own thing. But I think the gap is closing. We are accepted locally, and the fact that the area has just arrived in them: people in the OU seem to be deciding that they must make a contribution locally."

One result of this is that pressure groups like the local Transport Users' Group and the Milton Keynes Housing Action Group have become a lot more vociferous, thanks to an influx of academics and other university staff, complete with what Mr Thomas describes as "fluency, and the knowledge of how to get round organizations." The taken on a new lease of life.

"The interesting thing is that this is the first new town to have a university—and it is working," Mr Thomas says. "The university does attract energetic and able young people who get all these things going, so in that respect Milton Keynes is better off than other new towns."

Milton Keynes could be forgiven for not yet appreciating this, and for suspecting that many of the functions put on at the university seem to be principally for the benefit of itself and its staff.

What may be more apparent is the boost that the university has given to local employment. With expenditure this year estimated at £18m—and the major part of that going in wages—the OU plays a big role in the local economy.

When we first came here in 1969, the site was just mud—mud, mud, mud," says Mr Eddie Whitaker, assistant personnel manager at the OU. "Our big worry to begin with was where we would be able to recruit people like biology technicians."

As house prices in the area soared, there was an accommodation problem too. But the university did benefit in unexpected ways, such as a decline in the local printing industry which enabled them to recruit skilled printers quite easily, and the growth of industry in Milton Keynes which brought in families and eased the clerical and secretarial difficulties which the OU began to experience.

Although the OU does not pay the highest wages in the area, it is a popular employer because of the attractive site and working conditions, and such fringe benefits as 18 days' holiday a year with an additional week at both Christmas and Easter.

However, there is still pressure on space, with some staff having to work in temporary buildings. "A university has to prove that it gets the building before it gets the people," Mr Whitaker says. "Office accommodation could be a serious problem for us."

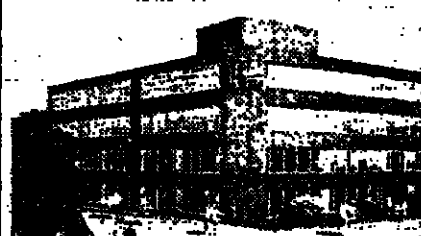
Perhaps because of its own problems, and perhaps because of the comparatively slow development of Milton Keynes, the OU has so far forged only tenuous links with local industry. University staff do have some professional connections with Hoechst UK, the German drugs firm which is their nearest industrial neighbour.

But in general, academics have not yet established the research links which exist in many university towns. These links will undoubtedly come. The Vice-Chancellor has had local dignitaries to lunch. The OU's very active film society is open to the public, and the university would be glad to see more local people at the regular dances and discos on the campus.

Such concessions may eventually win over the new-comers to the area, but they are unlikely to impress people like the Boutwoods, who say that since the new town and the university arrived the kingfishers have disappeared from the river near by.

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Soviet agriculture struggles to escape from the grip of the desk-bound 'farmers'

Why is the Soviet Union unable to grow enough grain? The question obviously bothers Brezhnev, for his press never tells this people that they periodically pay huge sums in hard currency for grain from the crisis-ridden lands of capitalism. It also bothers President Ford, who has to cope with the political and economic effects of unpredictable surges in Soviet buying. Developing countries are no less concerned for the poor Soviet harvest of 1972 contributed to the trebling of cereal prices on the London market. A large number of people therefore want to know what prospects there are of the Soviet Union covering her needs or even resuming her lost role as a regular net exporter.

The short answer is that Soviet agriculture is improving but slowly and at great cost. Comparisons with the United States are unfair but revealing. The Soviet Union has roughly half as many tractors as the United States and a fraction of the number of ancillary workers in maintenance, supply, and other services. The Soviet Union uses about half the average American amount of mineral fertilizers per acre and pays more in price support than any other country in the world in absolute terms and in relation to national income. About a third of the Soviet working population produces somewhat less than enough for 241,700,000 people while about 4 per cent of working Americans produce much more than enough for 203,200,000 people.

The comparisons are unfair because the Soviet Union has a smaller proportion of good land than the United States, a generally worse climate, a different history, and a different population structure. Among other things, a high proportion of the rural workers are elderly unskilled women

who would not adapt easily to modern methods under any system.

Nevertheless, political systems past and present must take their share of the blame. Stalin systematically exploited and disrupted agriculture as he pushed the country into rapid industrialization. Then came Mr. Khrushchev with grandiose schemes which caused another sort of havoc.

Mr. Brezhnev has been working hard to make up for lost time. Big new programmes of mechanization, land improvement and price reform were introduced in 1965 and 1970. Investment grew 69 per cent in 1966-70 and is planned to have grown by another 57 per cent by the end of this year, which is faster than in any other sector of the economy.

Agriculture and related sectors now receive 31.35 per cent of total investment.

As a result plans are being fulfilled more reliably than in the past and an annual average growth rate of about 4 per cent is assumed. When imports are needed they are not to save the population from starvation but primarily to maintain livestock and thereby meet rising demand for more and better meat.

But Mr. Brezhnev is certainly not satisfied. The costs of agriculture are very high. Gross inputs have doubled since 1965 while gross output has increased by about 45 per cent, and the rate of return has been declining. This is partly accounted for by higher prices for machinery, and by investment in long-term projects, such as

fertilizer plant, land improvement and infrastructure, but against that there has been no direct investment in the private sector, which continues to provide about a quarter of total output. (Obstinate peasants who were moved into blocks of flats with no private plots grew onions on the roof. Others just refuse to move.)

Obviously money alone is not the answer. The problem is to absorb it usefully. Not until the current five-year plan did input targets begin to be met in full, and even now investment is often wasted. The Soviet press is full of stories about bureaucrats allocating money where they are not needed, ignoring requests where they are needed, and harassing everyone with streams of useless instructions.

Even worse is the shortage of

trained mechanics. It might seem a simple matter to direct more young men into training schemes and thence to the farms, but coercion of that sort is no longer part of the system. Young men drift away to better paid jobs in the towns, leaving grumpy to tend their private pigs amid the rusting machines. About 600,000 mechanizers completed their training in 1971-73 but by the end of that period the number employed on farms had risen by only 3,000. This may help to explain why, although 2,762,200 tractors were delivered in 1966-74, the number in use rose by only 675,000.

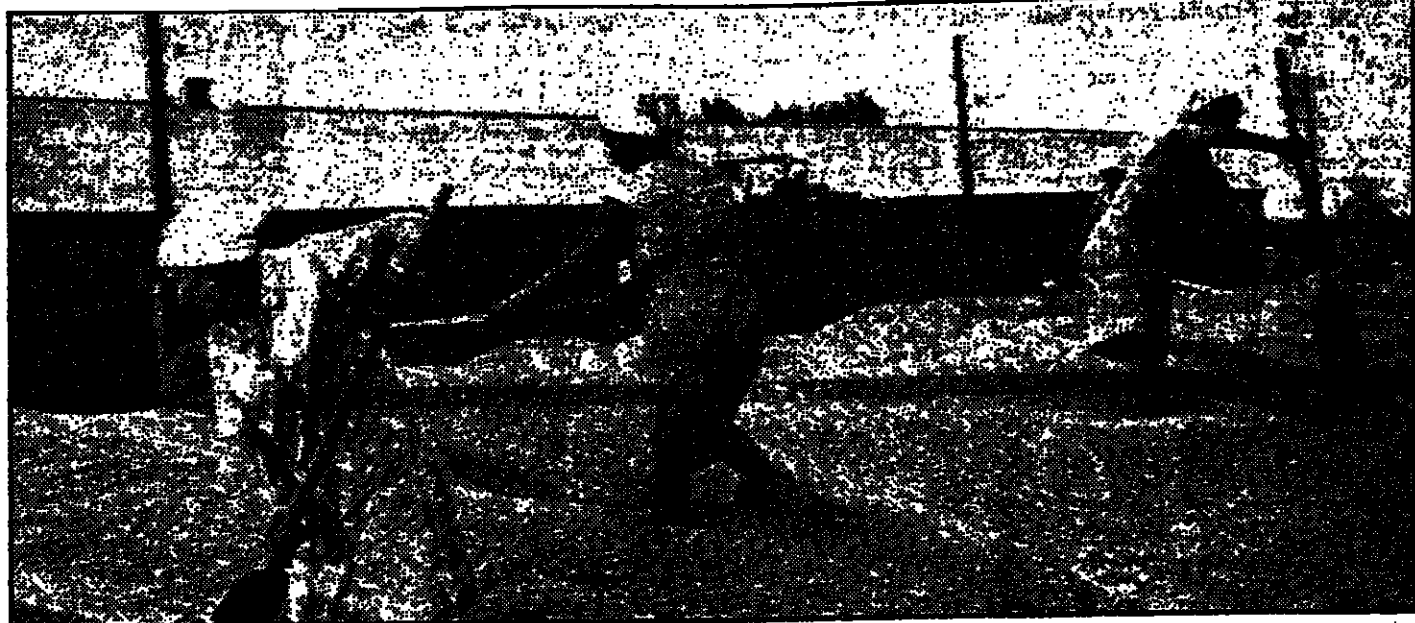
The average wage for collective and state farm workers is still well below that of industrial workers. The gap is being narrowed in the current five-year plan, which gives a

30 per cent wage increase to farm workers and 22 per cent to others, but conditions of life on the land, in spite of improvements, still tend to drive away the best and brightest young men.

Behind this lie other problems. Price reforms have made farming nominally more profitable than it was, and raised incentives. There is even a 50 per cent price premium for sales above the plan. But bureaucratic directives still determine production more than prices, which reduces the incentive to farm efficiently. At the same time the political need to keep down consumer prices means that state subsidies are now enormous. According to western estimates total subsidies on procurement in 1975 could amount to something like £13,300m, which is more than the overt defence budget, though less than the real one. On top of this come huge bills for land improvement, machinery, roads, railways and housing, which make up more than as much again.

Seen through western eyes, therefore, Soviet agriculture is becoming more effective but scarcely more cost-effective. In fact, western experts predict that the USSR will continue to sink. Provided the government is ready to go on pouring in money it can probably achieve the self-sufficiency it seeks, and even resume modest exports of grain. But a small feed will have to be imported for some time if meat supplies are to keep up with demand, and there are very serious problems to be met in keeping trained men on the land, improving management, and reducing the huge burden which agriculture imposes on the economy as a whole.

Richard Davy



Drying wheat on a collective farm near the Black Sea: many rural workers are unskilled elderly women.

Counting the cost of Scotland's new spendthrift councils

The new local government areas in Scotland, launched only three months ago after many years of agonizing, have had an unfortunate start to life. Long before they were able to demonstrate their better service to the public or prove that they are more cost-effective than their predecessors, they have already driven industrial and domestic rates sharply upwards as the new executives of the regions and districts were being appointed at substantially higher salaries than their predecessors. The explanation, reasonably, was that larger areas and greater responsibilities deserved more pay. Higher salaries were also necessary, ratepayers were told, to attract talent from outside the dusty corridors of local government but in many areas the new local government management proved to be the same faces sitting behind more imposing desks.

When, three months after they had got to work, local government officers were awarded a 22 per cent rise, giving some senior officials up to £3,000 a year more—simultaneously with Mr. Wilson's appeal for a general tightening of belts—scarcity turned to anger. A sprinkling of perquisites, including 51 per cent home loans, all democratically agreed and voted through the new councils, added further to the anger and even caused a Government minister to demand the dismissal of the senior executives in the central region.

Altogether, the impression has been that at a time when the new local authorities should have been winning friends and oppressing the people, life has impelled them to do quite the opposite. The new rate demands are now delivered and the cost of the first major reform of

local government in Scotland for 40 years is, in the public mind at least, coming home to roost. The result has been the sudden birth of a number of ratepayers' organizations, threatening a substantial number will withhold their money, and indignation in some rural areas is having to be soothed by a further layer of administration in the form of the Scottish Assembly, the cost of which to the taxpayer is causing some former enthusiasts to pause in their revolutionary tracks.

Precisely how local government could establish better relationships with the public by being more openly accountable to them is the subject of a study by Professor Alan Thompson, former Labour MP and now Professor of the Economics of Government at Heriot Watt University, Edinburgh. He believes the present situation in Scotland deserves to be examined by a Parliamentary Select Committee and he has also called on the Lord Advocate to speed up the legislation which will eventually give Scotland a local government ombudsman. Ideally the ombudsman should have direct access to him and should not have first to seek the approval of a councillor. He should have the right to question any local government official and call for documents. He would then be more obviously effective and would not give the impression of an ombudsman.

Professor Thompson also believes the powers of the Comptroller and Auditor-General could be strengthened in the sphere of local government spending, while the remit of local government auditors might similarly be extended. Perhaps the crux of the prob-

lem in the present local government organization, he said, was that the auditors concentrated on whether or not a decision was legal rather than making any observations about the cost effectiveness or efficiency of a project.

"At a time when the high level of rates and taxes is being levied, the stability of costs of local government administration, I would prefer to see much greater scrutiny of local government spending by outside auditors with power to interrogate officials on how they are spending public money," he said.

He advocated a system where auditor inspectors had the power to impose penalties on prodigious councils. "Rightly or wrongly the public suspect that the change in local government has been an excuse for unjustified increases and perquisites for a wide range of officials and for proliferation and duplication of well paid posts, not always justified on economic grounds. For example, one authority in Scotland recently decided to pay its deputy director of administration a salary higher than that of the public really consider this man's responsibilities are greater than those of Mr. Callaghan?"

A difficult transition to survive with a massive volume of new legislation to handle and it was essential that the new councillors and their chief officials established good working relationships. It was therefore better that the efficiency and the effectiveness of local government should be judged by an impartial third party.

Ronald Faux

Britain's political romance with Romania

With noticeable promptness the announcement of the dates for Mr. Wilson's visit to Romania, September 16 to 18, has now followed the announcement that Mrs. Thatcher, the Leader of the Opposition, will herself start a four-day visit to Romania on August 31. Before September 16, the Speaker of the House of Commons is also due to visit Romania.

Two visits. Knowing the desire in Britain for a real development of East-West détente through increased contacts, the party leaders are naturally glad themselves to pursue promptly a popular policy of contacts—particularly with Romania, since no Fast European people years more than the Romanians for genuine détente and cooperation. The Speaker's visit is made, however, as representative of the whole Parliament.

September, in fact, will be something of a landmark in Anglo-Romanian affairs, and this accumulation of British visits may fairly be regarded as primarily a natural and vigorous follow-up of the Helsinki conference.

Mr. Wilson's visit is the first by a British Prime Minister to any East European communist country, apart from Russia, since the war. In demonstrating British friendship it will certainly please President Ceausescu. The strong bond which still unites him and his rigorously authoritarian regime with the people of Romania has been his spontaneous and passionate denunciation of the Soviet invasion of Czechoslovakia in 1968 and his courtain, as far as possible, Romania's independence. He knows that Romania's geographical position makes it impossible for her to hope for the Titoesque vision of a

wholly non-aligned road for Romania, but he has maintained the semblance, and in a limited measure the substance of independence, by a policy of "silk cords" of cooperation with all peoples, by constant visits to the Third World and the West.

President Ceausescu, who is 57, has always been a dedicated communist and spent three years in prison for his alleged industrialization Romania as rapidly as possible with the primary purpose of making her independent of Russia economically, and meanwhile to give the Russians no excuse to accuse him of abandoning strictly orthodox communism.

This means an all-pervasive security organization, continued suppression of all political opposition, and the strict control of the press. It would be clearly impossible, therefore, for any British political visitor to approve the regime which he or she will find, but Mr. Wilson and Mrs. Thatcher will remember that Romania, at the crossroads between eastern and western empires throughout her long dangerous history, has never known anything but autocratic rule.

It will be interesting to see if any differences emerge in the attitudes of the Romanians to their guests. Mr. Ceausescu, being President of the Republic and having been re-elected last November as Secretary-General of the Romanian Communist Party for the next five years, is as near to holding absolute power as he could be. With him will be Mme. Elena Ceausescu, who accompanies her husband on his visits abroad, and who is an acknowledged leading Party in her own right.

For the Romanians the value of Mrs. Thatcher's visit may be to demonstrate that there can

be sensible debate on matters of common interest even with those western party leaders with whom on political doctrine—on the merits of private enterprise, for instance—they cannot possibly share eyes to eyes. In public will certainly be warm, but the talks in private could be tough. Communists and parliamentary socialists are not normally easy partners. Few one, longstanding Anglo-Romanian friendship, proved hard to settle. More over in view of the Queen's commitments the British Government cannot, at least for some three years to come, offer President Ceausescu the state visit to Britain, which he would prefer to an official visit as a guest of the Government. Mr. Wilson's visit to Romania would hardly have been arranged now, however, if some increase in Anglo-Romanian trade and in economic cooperation over Romania's industrialization programme were not already foreseen.

Meanwhile in the short term no one should be disappointed if in the immediate aftermath these British visits seem to have produced little concrete result or even to have been counter-productive. The more the Romanian public takes the opportunity to show enthusiasm for its western guests, the more likely is it that President Ceausescu will play down the results, if any, and seek ways to compensate Russia.

All the same, if the Russians realize, as they surely gradually will, that such visits do not undermine in any way their own security system in Eastern Europe, next month's exchanges in Bucharest will be a worthwhile contribution, slight, perhaps, but definite.

A. M. Rendel

Angola: Why civil war seems inevitable

The coup in Portugal in April, 1974, surprised no one more than the leaders of Angola's three liberation movements. Essentially, they had lost the protracted guerrilla struggle of some 13 years, and only one, the National Union for the Total Independence of Angola (UNITA), so much as had its headquarters inside Angola. The anti-communist National Front for the Liberation of Angola (FNLA) was, and is still, based in friendly Zaire where its leader, Mr. Holden Roberto, is a successful businessman. It has a few camps scattered along the border with Angola from where its 15,000 or so guerrillas, Bakongo tribesmen sheltering in Zaire from Portuguese reprisals, made occasional forays into the colony.

The Popular Movement for the Liberation of Angola (MPLA) claims vast tracts of liberated territory but, in fact, controls only the far east of Angola where its commander-in-chief, Daniel Chipenda (since deposed by the FNLA), waged a reasonably successful war. It also managed some political infiltration of the urban areas which it was able to capitalize on more fully after the ceasefire. For the rest, the MPLA's 3,000 or so guerrillas were stationed in either Congo or Brazzaville, from which they, too, made occasional raids into Angola. What is more, at the time of the coup, the MPLA was so split by internal disputes that the OAU liberation committee was considering withdrawing its recognition and financial support—as it had to three years earlier, when it, too, had been threatened by inactivity and power wranglings.

The third movement, UNITA, under the charismatic personality of the FNLA's foreign minister, Mr. Jonas Savimbi, boasted a mere 600 guerrillas, but, in the south among the Ovimbundu tribe, their attacks and ability to melt into the night were causing the Portuguese some agitation, but nothing more.

Then came first Spínola, and after him the majors, all armed with promises of ceasefires and future independence. The situation for the movements immediately altered: they each experienced a massive build-up of morale, soldiers and arms. Today the FNLA's armies each number about 20,000 according to Portuguese sources, while UNITA boasts approximately 22,000, of which slightly less than half are actually armed. Movements are now supported also by testimony to the shrewd Portuguese control over the hearts and minds of the general public.

Significant build-up of arms

The FNLA's main support, and military sphere of influence, is in the north-west of the country, among the Bakongo tribesmen who straddle the border with Zaire. The organization itself started life as a Bakongo royalist group but attempted to widen its appeal, largely unsuccessfully, after Roberto came into contact with other African nationalist leaders in Accra in 1958. Its initial international support came from America, Tunisia, Algeria and the Congo, who provided weapons and training. Today Zaire is the main source and channel for international support, while China provides instructors and arms, primarily to counter the heavy Moscow orientation of the MPLA. China's ideological influence on the FNLA is slight, however, and its strong anti-communist leaning. While America and France might well be covertly helping the FNLA which, ideologically, is probably closest

to them, there is no overt aid in the form of weaponry, and for seven French Paratrooper battalions, none the less, they have built up their army significantly in the last months.

The MPLA which, while maintaining the form of a popular front, is a Marxist-Leninist movement, has less of a tribal base than the FNLA or UNITA. But it has largely failed to extend its sphere of influence to Bakongo or Ovimbundu tribesmen and gets most of its support from Kivimbundu of Lunda and Shona descent. It is supported by Angola's large, mixed (mixed blood) population, many of its leaders are in mestizo intellectual circles. MPLA's origins are rooted in the influence of underground Portuguese communist Party over its intellectuals in the Fifties. MPLA's leader, Dr. Agostinho Neto, for instance, is a mestizo poet and physicist trained in Lisbon. The FNLA is now extremely well equipped, and like the FNLA, is receiving a constant flow of arms over the last months. The standard issue Kalashnikov machine gun, the FNLA has armed at least 7,000 civilians in Popular Power movements politically and militarily. MPLA is better organized, more disciplined than the other two organs and has tended to take then keep the political military initiative thru the war of the last month.

Appeal of moderate socialists

UNITA, is still by far the weakest of the liberation movements while, ironically, probably the most popular. This is the appeal to Ovimbundu of the central plateau, who account for more than 50 per cent of the population. UNITA's president, Mr. Savimbi, has been justly praised for his efforts in bringing the movements together in conferences on five occasions in the last months, and also for his prophetic of peace. This is the appeal to Ovimbundu of the central plateau, who account for more than 50 per cent of the population. UNITA's president, Mr. Savimbi, has been justly praised for his efforts in bringing the movements together in conferences on five occasions in the last months, and also for his prophetic of peace. This is the appeal to Ovimbundu of the central plateau, who account for more than 50 per cent of the population. 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NO EARLY REFLATION

The National Institute of Economic and Social Research is a body whose explicit and documented quarterly assessments of national economic progress and policies have done much to raise the level of public debate and understanding. When they call, as they do in their latest *Economic Review* published today, for "early but not premature" reflation, they deserve to be heard and to have their arguments met or accepted.

The major factual premise of the Institute's argument need not be put in doubt, namely that "the economy has moved rapidly since the end of 1974, but unemployment has reached its highest level for thirty-five years and is still rising... (and) the rate of inflation is likely to continue to rise as much as one and a half per cent by the end of 1976". The National Institute's further assessment that "severe unemployment is a course highly undesirable" is also sound.

The National Institute are distressed with the Government's policy in the face of so severe a recession, a strategy which it characterizes as "waiting for the world" to raise the rate of inflation to the level of the rest of the world. The problem is that the world is already "late", and although the forecast that it will be still "late" by further policy changes is optimistic.

Normally, at least, the National Institute have a good debating strategy when they say that "it is important to be clear that 'waiting for the world' is not a policy of reflation—eventually, a government committed to reflation, cannot argue deep and prolonged recession is necessary to check inflation though it can of course be a consumption-led reflation".

DEATH OF A FALLEN EMPEROR

He died twenty years ago, Haile Selassie would have been mourned the world over. His father, Emperor Menelik II, was a modern state was entirely his handiwork. His leadership and thanks to his personal initiative it had freed many of the benefits of Western penetration to Africa in the nineteenth and twentieth centuries: the abolition of the slave trade, technological advances, above all education. Yet it is to him it survived as an African African entry with a glorious history. Haile Selassie had already established Ethiopia's personality as a member of the family of nations on his own right. Unlike earlier African acquisitions, the Italian Empire of Ethiopia was clearly for what it was, and never a *quo*. Haile Selassie resisted five years later, with the British troops, he returned

WARE THE MACE-MAKERS OF MUNICH

eter Shore is not yet the manager of the House Commons but he had better himself to being treated as were for the duration of his session. He has been, on and off, a moderate of moral protectionism. It is what his "buy British" can find something to suit. It is postulated a moral duty to abstain from alternatives to home-produced goods if a suitable article is available. It is a harmless substitute for controls and tariffs, not only because it does not add a further value without nuisance value adds a further perplexity private citizens already in search for his public this teasing world. Minister who sounds forth

English Professor Herbert Pilch with slight surprise that in last Friday's *Times* the article of Dr Wells' lecture to the national Congress of Phonetics, pretending alarm (as at "the bad news") that the way it is laid down in the chairman of the phonetic society, let me assure you that I am far from refusing to be good or bad, positively in the wealth of pronunciation, being tacitly convinced to the point. After all, why seek to destroy what we

covery would damage the balance of payments.

The Review reasonably takes the view that the balance of payments no longer presents an overriding obstacle to gradual reflation (and, more controversially, that if it did, import controls would be the answer) and therefore they conclude that progressive stimulus of home demand is safe. The logical weakness of this argument, up to this point, is that it is predicated on, among other things, the Government's formal commitment to a policy of "reflation". To discard the conclusion might embarrass ministers but it would not necessarily be wrong.

There has throughout the present Government's period of office been an unresolved conflict between the Chancellor's apparent willingness to adopt a monetary policy which must cause a progressive deeper recession so long as labour costs on increasing its price faster than it increases the value of its output and his insistence that the export-led recovery would be safe and will indeed provide a solution to rising unemployment within the foreseeable future.

If a strong recovery in demand for British goods and services were to occur in the wake of a strong recovery of the world economy before the British recession (or the incomes policy) had cured inflation, then the Chancellor would either have to limit export growth by allowing the pound to appreciate against other currencies or have to abandon his anti-inflationary fiscal and monetary policies. So far he has dodged that issue; and it may be that the prolongation of the world recession will enable him to go on postponing a choice for a year or more to come.

The truth is that the promise of export-based reflation is a pledge which the Government may well not be able to permit to be fulfilled even if world trade recovers as he says he hopes. It therefore will not do for the National Institute to infer a conclusion about what policy ought to be from a list of premises

in triumph to his throne. He thus personified the resistance, both of small nations and of African nationalists, of African nations against European colonialism. It was natural that he should act as a kind of godfather to the new African nations which attained independence in the 1950s and 60s, and that his capital should be chosen as the seat of the Organization of African Unity.

Had it occurred two years ago, his death would have inspired much more mixed feelings. Personal sorrow would certainly have been felt, especially by those old enough to remember the dark years of 1936-41, and would no doubt have been speculatively expressed by the Ethiopian masses in towns and countryside. But with this sentiment would have been mingled, in varying proportions, those of relief, anxiety and hope. Relief because it was by then glaringly apparent that the Emperor had long lost touch with the problems of his country, though many of them were the inevitable concomitant

along those lines must expect his own purchases to be scrutinized for evidence of backsliding. Mr Shore was shown to be in the clear with respect to his choice of car. But now comes the Commons crockery exposé. The fact that with him is neither here nor there. He has made buying British his department, hasn't he?

The irony is that Mr Shore has at hand a full and sufficient answer to the teapot chauvinists in the issue that was decided by referendum in June, if only he had not been on the losing side: namely that since January 1, 1973 "made in Germany" equals "home produced". The European Community exists, in its economic aspect, to make perfect within its ground the beneficial operations of free trade. No

pect for the contributions which our colleagues from Eastern Europe have made, and I am sure that this feeling is widely shared. I remain, dear Sir, your obedient servant. HERBERT PILCH, Professor of English, Albert-Ludwigs-Universität, Freiburg i.Br.

Flying to the Shetlands

From Mr John E. Story
Sir, I should like to comment on Royal Mail's regional report of August 18.

Viscount aircraft have given British Airways good service for many years and are likely to continue doing so until well into the 1980s. However, three problems arise when operating Viscounts into Shetland:

1. Operations at night are prohibited—in the winter this means up to 19 hours in a 24-hour period.

which includes the fact that the Government has given such a pledge; all the more since the National Institute take leave to inject other elements in the Government's strategy.

Their case is not helped by being further supported by a spectacularly weak additional argument, namely that if the trade unions, who supported the new pay policy because they were told that there would be more unemployment otherwise, now found "that unemployment continues to rise fast into next year, then it is probable that support for the pay policy will fade and turn to outright opposition". A few sentences further on the Review concedes that argument by remarking that "it is not long since the threat of unemployment was being used in the bargaining over the new incomes policy... the bargaining weapon cannot be discarded completely before there is concrete evidence that the bargain is being kept".

Either unemployment tempers pay claims or it aggravates them or possibly neither. But it cannot seriously be argued in the same context that it does both at the same time. More generally the National Institute are just wrong when they assert that "the logic of an incomes policy is not the same as the logic of a high unemployment policy"; the Government has chosen the first of the alternatives and should follow it through.

The Government has rightly chosen to check inflation by fiscal and monetary restraint. It is further trying to accelerate the effects of this restraint on pay settlements, and so on unemployment, by inviting people to limit their pay claims rather than price themselves out of their jobs. To treat the pay restraint programme as an excuse for abandoning the fiscal and monetary restraint would vitiate the whole logic of the Government's policy and, more seriously, would lay the foundations of the next inflationary explosion, just as the present one was prepared by Mr Heath and Mr Barber in 1971-3 with the full-hearted encouragement of the National Institute.

of the earlier progress which he had done. As for his personal power had become the greatest obstacle to further reform. Anxiety because his person was still the main element of stability and cohesion in a country already badly undermined by famine and civil war. Hope, because at least his death would have opened a possibility of non-violent change.

Fate would have been kinder to let him die peacefully at either of those dates. He would then have spared the agony of seeing friends and relatives led away to prison and execution, the humiliation of seeing himself stripped of power and then of office, and left to live his last months as a lonely prisoner in his palace grounds. As it was, history did not wait to let him and his life gracefully. Coming yesterday, his death can have little impact on the political situation in Ethiopia, or anywhere else, since politically he had already been dead for nearly a year. For his friends it can add little to the sorrow already occasioned by the circumstances of his downfall.

tariffs, quotas, border levies, preferential transport charges, restrictive trade practices along frontiers, or discriminatory subsidies, are to interfere with the circularity of commerce within the perimeter of the Nine. The Commons catering sub-committee (overdraft £350,000) resolved to join the Community; or rather, the Commons resolved to join taking its sub-committee with it. The nation endorsed the action by voting Yes. The home market, as was explained before-hand, became 250,000,000 strong. To crown our partners' products as being in any serious sense foreign must now be regarded as a kind of recidivism. Getting your teacups from the Germans is what the Common Market is all about. Let us hope that they make better teacups than they make tea.

2. Regularity and reliability of services is poor—a high proportion of Viscount services on this particular route have either to be cancelled or have to divert due to low cloud or high crosswinds.

3. Profitability is poor, primarily because runway restrictions mean that the 71-seat Viscount is normally limited to a maximum capacity of 45-50 passengers. By operating the HS748 into Shetland, British Airways will be able to operate at night, with a higher degree of regularity and reliability, and at an improved level of profitability. Shetland is probably the fastest growing airport in the British Isles and purchase of the HS748 ensures that British Airways is playing its full part in Britain's North Sea oil effort. Yours faithfully, JOHN STORY, Planning Manager, British Airways, 17-27 High Street, Hounslow, Middlesex.

Hard times ahead for universities

From Professor David Lowenthal
Sir, As an American who has taught for the past three years in a British university, let me revise the lesson of your leader in August 25's *Times* by querying its assertion that "higher education is in an even more precarious condition" in the United States. The diversity of educational structures in the United States in fact permits a much more heterogeneous response to financial stringency than is the case here. Some universities have closed completely, others have amalgamated, still others have altered programmes or removed barriers that formerly restricted student intake. As a consequence, while some academics have lost their jobs and many aspirants are unable to enter the university world, living standards for most have not noticeably deteriorated.

In Britain, the chimera of parity in higher education has had precisely the opposite effect. An atmosphere of bleak impoverishment pervades all institutions and affects all staff members. You recommend special treatment for a few favoured centres of excellence—a reestablishment of elitism. But the solution lies rather in a reform of funding for higher education which would permit substantial reallocations in response to shifts in demands and opportunities. Unless the Government can effect its intended economies without inequity eroding living standards for all academics, the decay of morale will ensure that in a few years only the second-rate will remain.

Yours faithfully,
DAVID LOWENTHAL,
Professor of Geography,
56 Crown Street,
Harlow on the Hill,
Middlesex, August 25.

From Professor A. M. Ross
Sir, There is much that is sensible in your leader on universities and their financial problems. You are wrong, however, to seek a solution along the lines suggested by the Vice-Chancellor of Birmingham. There is no doubt that Birmingham is on the verge of becoming a great university but in this matter we

Prison censorship

From Mr Graham Zellik
Sir, Lord Longford (August 23) asks why the prison authorities prevented a prisoner from replying to a letter in connection with a requested transfer to another prison. The explanation is simple: prisoners are forbidden to communicate with anyone outside on matters regarding their treatment or conditions in prison. They may, however, write to family members.

As for the National Council for Civil Liberties, to which Lord Longford refers, a prisoner may write to them only about his case. These restrictions derive their validity from rules 33 and 34 of the Prison Rules, which reposit what is very nearly a complete discretion to the Home Secretary in controlling inmates' correspondence. The rules, in turn, owe their authority to the Prison Act, 1952, which confers a rule-making power on the Home Secretary over the whole field of prison administration and notional parliamentary supervision. It was the confident hope of many observers of the penal scene that the whole question of censorship of prisoners' letters would undergo extensive change following the decision of the European Court of Human Rights in the *Golden Case*. But Mr Jenkins has now announced that the case had no bearing on censorship generally, although he is proposing to relax censorship of mail in open prisons and to have discussions with the prison staff associations with the question of prisoners' letters to members of Parliament. Perhaps in due course he will think it is even a subject suitable for discussion with members of Parliament themselves. While the European Court's judgment was lacking in precision and

Foreign tractors

From Mr S. E. Sexton
Sir, In North Cornwall you can buy a Czech tractor for £2,200. A comparable British one costs £3,000. Furthermore the Czech spares are immediately available, fitted at the farm, and cost less than British too. Regrettably a foreign tractor now saves the British farmer both time and money.

Yours faithfully,
S. E. SEXTON,
Trevalga, Tintagel,
Cornwall,
August 25.

Israel's atomic bomb

From Mr L. D. Freedman
Sir, Tad Saul's usually reliable sources appear to have let him down. His suggestion, reported in August 21's *Times*, that the CIA played an important role in the development of the Israeli nuclear capability is hardly credible. Saul claims that United States provided nuclear scientists were working for the Israelis at their "Dimona nuclear research centre" during 1957 and 1958. However, the only research facility at Dimona is connected with the nuclear reactor there, which did not become active until the mid-1960s.

The United States only discovered the construction of the Dimona reactor in 1969, leading to a strain in United States-Israeli relations. The Americans were annoyed because the open assistance they had been giving the Israelis on atomic energy at the Weizmann Institute and the small American supplied reactor at Nahal Sorek might have been used for non-peaceful purposes. More interesting was the "CIA plot" in the development of Israel's nuclear capability is the "French connection". The French not only provided the Dimona reactor without insisting on any safeguards against military use, but, are also reported to have col-

must scrutinize the parts rather than view the whole.

Several of Birmingham's departments do not at present time have an international reputation. Several of its departments are undistinguished. This is not to say that the latter will always remain so; departments, like universities, rise and decline. Dr Hunter cannot really believe that all his departments are excellent. Indeed he has not to look far to discover a new university which in a remarkably short time has already achieved an outstanding international reputation in one or two fields.

Certainly we should give extra resources to centres of excellence, not only whilst they are excellent. No doubt Birmingham as a large university has more centres of excellence than less well established foundations but the fact of having been employed by Birmingham is not itself a sufficient national resource. The problem is one of research rather than teaching. The research council system might well be used to manage this operation. Already "heavy" physics are concentrated in a few places.

In areas which are labour rather than capital-intensive, research grants (competed for) could be used to release staff time for research, the funds being used to make short-term teaching appointments. There are obvious objections to this but if we are to preserve and develop our higher education in the present difficult situation, this is a price which may have to be paid.

In this case the emerging points of excellence could be identified and supported wherever they appeared—in Redbrick, Oxbridge, Polytechnic, Plateglass, College or Research Institute. Let us have equality of opportunity to maintain and to develop excellence. Yours faithfully,
A. M. ROSS,
University of Lancaster,
Department of Educational Research,
Carmel College,
Bailrigg, Lancaster,
August 25.

offered little guidance to the Home Office, it is nevertheless incredible that the Home Secretary has been advised that the decision does not bear directly on the question of censorship generally.

This deliberate failure to accord respect due to the court's reasoning and the flagrant refusal to recognize its inevitable implications reflects not only on the minister immediately responsible but on the entire Government's respect for the rule of law.

It is as if the Government has been determined all along that Britain should emerge from the present proceedings as tarnished as possible. First was the unpalatable decision to defend the rule on access to lawyers for the purpose of bringing legal proceedings; secondly, there were the dubious and even disreputable arguments used in that defence; thirdly was the refusal to reach a "friendly settlement"; fourthly was the persistence in defending their position before the court after the Commission's unanimous findings; and now comes an interpretation of the judgement that would have done credit to a pleader in the courts of common law in the fifteenth century. For those of us who are in frequent touch with penologists in Europe and elsewhere, this catalogue is not one of which we can feel proud.

The issue will surely find its way to Strasbourg on another occasion, but the process is a lengthy one. Meanwhile, if the Home Secretary is not prepared to move on the basis of legal considerations, perhaps we can ask him for a defence of the existing restraints on their merits, starting perhaps with the important area raised by Lord Longford. Yours faithfully,
GRAHAM ZELICK,
Faculty of Laws,
Queen Mary College,
Mile End Road, E1.

laborated closely with the Israelis on many atomic energy matters.

There is nothing in the actions of the United States administration, or any subsequent United States administration, to support Saul's contention that there was a "resolute" to help Israel become a nuclear power. All the evidence would point to the opposite conclusion: that the United States has consistently attempted to abort any Israel moves towards the manufacture of nuclear weapons. Yours faithfully,
L. D. FREEDMAN,
Research fellow, Nuffield College, Oxford,
45 from 48a Poyts Road,
Raynes Park, SW20.

Frank Thompson

From Mr Stowers Johnson
Sir, In Agents Extraordinary it is clearly shown that Major Frank Thompson was an ardent student of Lawrence, indeed, one of his porters on active service was an essay on T. E. Lawrence given him by his brother (page 31) about which he had expressed admiration in a letter to his family.

Surely Mr Eve does not imply (Letter August 26) that an SOE officer could write letters home across the censorship about military strategy. Actually, Frank Thompson could write no letters at all during the critical period. The last officer sent out to discuss strategy with him was Lt Kenneth Syers (in "civvy life" the *News Chronicle* journalist) who obtained a thorough knowledge of Frank Thompson's aspirations and of his interest in Lawrence of Arabia. I have made full use of the information and material he provided in my book. Yours faithfully,
STOWERS JOHNSON,
Corbère,
45 Rayleigh Road,
Hutton,
Brentwood, Essex.

Agricultural tied cottages

From Mr Montague Keen

Sir, Mr Bortin, the agricultural workers' leader, may well be right to argue (letter, August 21) that occupancy problems of agricultural service houses are not strictly comparable with those controlled by British Rail; but he makes out no case at all for legislation discriminating against farming, while ignoring accommodation not controlled by such bodies: the vast numbers of service occupants of caretaker flats who have no powerful trade union to speak for them, to make political capital from their fears and to lay order for re-possession is secured.

What is far more disturbing to farmers, however, is the fact that both Mr Bortin's organization and the Government have failed to show the essential needs of the modern livestock farming—and much of horticulture—can be reconciled with an extension of the Rent Acts to include farm employees. The Government's consultation document answers few of the questions which ought to have been the subject of intensive investigation between the DoE and the local housing authorities during its long gestation period.

These questions were posed, and remained unanswered, in the autumn of 1964 when Richard Crossman, as Minister of Housing, found himself saddled with the same duty to honour an official undertaking to the Labour Party to sweep away the system. He could not do it; nor could he impose on local authorities burdens of re-housing which they could not contemplate or inviting crippling consequences for livestock farmers, whose businesses—and animals—are absolutely dependent on the availability of specialist workers living on or very near the job.

Abolition of GLC

From Mr Hugh S. Redfern
Sir, All organisms arrive at a point where they must either expand or wither away and die. The GLC has shown extravagant self-generated growth in recent years, but even it now takes the view that it can only grow still faster by acquisition. This, surely, is the message of the outrageous proposal that the GLC should take over the government of the City of London. Furthermore, if the GLC did take over the City, would its appetite be satisfied, or would it then seek to swallow up all 32 London boroughs?

My committee, which gained the support of more than 40,000 ratepayers of London when it was set up, believed that the GLC has shown its usefulness and become an extravagance whose passing few would mourn. We are confident that the vast majority of reluctant and dissatisfied London ratepayers will support our proposal that the GLC should be abolished.

The present functions of the GLC could be handled efficiently and economically by the relevant departments of existing London boroughs, together with a number of coordinating committees for which the London Boroughs' Association already provides a nucleus. The employment of a proportion of the operating staff of the GLC (for example in the housing and parks departments) could be continued by the boroughs, while the services of large numbers of the bureaucracy which the GLC has become could be dispensed with.

Just as the Metropolitan Police

Invitation to PLO

From Mr P. S. Gourgey
Sir, There is an obvious defect in the constitution of the Inter-Parliamentary Union that its violation, or "breach of the rules" according to Mr. A. W. M. P. (letter, *Times*, August 20), could be achieved by a simple majority and without prior notice as seems to have been the case at its Colombo conference in the spring of this year. Unless this defect is cured and approved remedial measures taken, Mr. Wall's resolution for next year's Spring Conference in Mexico designed to prevent this happening again. Yours faithfully,
P. S. GOURGEY,
4 Poplar Court,
Aldershot Road,
East Twickenham,
Middlesex.

permissible for each kind of beverage. If the traditional sizes were adhered to, there could be no public disadvantage, and the buyers would not always have to look for the smallest bottle. Moreover, there is a risk that, if the regulation went only to stating the bottle size, some bottlers could treat it as a licence to reduce bottle sizes and to depart from the traditional ones.

Yours faithfully,
JULIAN JEFFES,
Church Farm House,
East Isley,
Newbury,
Berkshire,
August 23.

Yours faithfully,
JAMES B. FELL,
Hayes Wood Cottage,
Reynoldston,
Swansea,
August 23.

Contents of a bottle

From Mr Julian Jeffes, QC
Sir, May I join with Professor Kurd (August 23) in urging that regulations be introduced which make it compulsory to indicate the capacity of the bottle, could lead to a perfectly innocent merchant to be persecuted.

The centre of the wine trade is now, however, rapidly moving from the traditional merchant, who always used the traditional sized bottle, to the supermarket, with the notorious tendency of the "marketing" executives in charge to reduce the size of the package rather than to increase the price. I have on my table in front of me at the moment two bottles containing the same French wine, one of 75 cl and one of 72 cl. Another instance of such a discrepancy was recently brought to my notice. In the circumstances it would be in the public interest if an Order were to be introduced obliging every bottle clearly to state the bottle size. By stating the container size rather than the quantity of the contents, merchants selling old bottled wine would be protected against the hazards of usage. Perhaps a better alternative would be for regulations to be introduced stipulating what bottle sizes were

Crossman had tied cottages on his own family farm, and understood the problem. All those who participated in the discussions to find an acceptable solution at that time, as I did, will realize perfectly well that the housing and financial conditions which led local authorities to reject discriminatory and preferential rehousing obligations for occupants of one type of service accommodation are with us still. Indeed they have worsened almost everywhere.

The extension of the Rent Acts last year to occupants of furnished accommodation has been a disaster, not least for the very class of persons the Government was trying to help. Blinded by political prejudice, the Government disregarded both independent advice and the conclusions reached by previous Labour administrations.

Now the same mistake is to be repeated: a pledge-honouring Bill is to be rushed into print before there has been time to discover just how any licensing system could be made to work, and work in a fashion which is equally fair to all farm employees and ex-employees, even one unacceptable queue-jumping rights in the rural housing lists, is deemed administratively workable by housing authorities, and is consistent with the Government's declared intention to create a climate for expansion in British farming, not least in the key sector of dairying, where confidence and output are both dangerously low. Mr Bortin's policy is bound to make both lower.

Yours sincerely,
MONTAGUE KEEN, Editor,
British Farmer and Stockbreeder,
Surrey House,
1 Throby Way,
Sutton,
Surrey,
August 21.

are the direct responsibility of the Home Office, so could the Fire Service; ILEA, at present responsible in practice to no one, could be placed under the control of the Department of Education. The transfer of London Transport to the Minister for Transport at the Department of the Environment would have the added advantage for Londoners of removing from them the unfair burden of the very large subsidy to London Transport which also benefits commuters and other visitors to London.

The national reorganization of local government, which took place under the last Conservative administration and which created the new larger units of local government, has raised the costs of local government—being regarded as unique, show the way again, by returning power to the more manageable units of the London boroughs which are more responsive to local requirements. They are certainly not perfect but they are, with a few notable exceptions, markedly more cost conscious than the GLC has shown itself to be in the last couple of years or so.

The GLC must not be permitted further self-aggrandisement, nor should we wait for it to wither; rather should it be rooted out before its financial demands on the overburdened ratepayers of London do yet more harm than they already have.

Yours faithfully,
HUGH S. REDFERN, Chairman,
The Greater London Rates Revolt Committee,
64 Carlisle Mansions,
Carlisle Place, SW1,
August 26.

Yours faithfully,
JULIAN JEFFES,
Church Farm House,
East Isley,
Newbury,
Berkshire,
August 23.

Yesterday's pleasures

From Mr William Ivor Jones
Sir, Mr C. T. Wilson asks in *The Times* of August 23 what pleasures we once had and do not now have.

A pleasure I once had and do not now have was the pleasure of knowing that the pound in my pocket was worth a pound the day I earned it, the next day, the next week and the next year. From that knowledge many other pleasures followed. If Mr C. T. Wilson is much under 50 it is a pleasure he will not have known.

Yours sincerely,
WILLIAM IVOR JONES,
Hayes Wood Cottage,
Reynoldston,
Swansea,
August 23.

From Mr James B. Fell

Sir, I can mention one pleasure not so very long ago, now lost: the relative freedom of the roads, which the car has completely abolished. I can recall walking along the country roads in the Isle of Wight as a child; and, a little later, in rural Essex, Yorkshire and other parts of the country, with no concern about dangerous traffic. Only in Sark, and some other islands round our coasts, does such peace and freedom survive.

Yours faithfully,
JAMES B. FELL,
1 Stanford Road,
Brighton,
Sussex,
August 25.

From Mrs A. M. Hart
Sir, Elbow room. Yours faithfully,
A. M. HART,
8 Gleadale Close,
West Stafford,
Dorchester,
Dorset.

The dialogue of science



Bill Sanderson

The 137th annual meeting of the British Association for the Advancement of Science, which opened last night at Surrey University, Guildford, is the first such meeting to be attended by the heads of the five research councils—agricultural, medical, natural environment, science and social science. An article on the following page of this Special Report examines the work of these agencies and the often conflicting priorities of research and teaching in a university context.

The report also discusses some of the other areas in which scientists strive to maintain a dialogue, with each other and with society. It is introduced by Pearce Wright, Science Editor, who looks at the theme of Sir Bernard Lovell's presidential address at Guildford: man's role "in the centre of Immensities, in the conflux of Eternities".

True, there is a universality about the concepts and language of pure science; these transcend frontiers created by historical events. But it would be foolhardy to believe that a group of individuals exists which is capable of forming a supranational or international scientific community and is devoid of the usual conflicts of politics and ideology. The notion begs two issues. One is that science and the state have become inextricably linked. Second, there is no such thing as the impersonal scientist. There are plenty of instances, including the letters column of *The Times*, to show that scientists are not notably more objective than anyone else in dealing with topics not within their own speciality. However, those who join discussion should be as warmly encouraged as the far higher number who are blinkered by their narrow speciality. The indifference caused by this tunnel-vision has played itself in the past in frightening and disquieting ways.

While it is understandable for the scientist to address a claim to new knowledge and discovery to his professional peers for judgment, there is an equal responsibility—or possibly a greater one—because of the privileged position society accords the academic—to explain the implications to a wider audience.

Apart from journals, newspapers and broadcasting, the opportunities for public discussion are woefully inadequate. Over the past few years the British Association for the Advancement of Science has been endeavouring to play a role in this process. Certainly the past few presidents have taken the opportunity to raise a debate on matters central to our health and welfare.

Sir Bernard Lovell, Professor of Radioastronomy, Manchester University, took the discussion one stage further last night in the opening ceremony at Guildford Cathedral to this year's annual meeting of the association at the University of Surrey. He posed for many scientists an unthinkable question: can man survive for long the consequences of the continued probing of the scientist to break through the barrier that has been reached in the attempt to comprehend the centre of immensities—

Recently astronomers using radio-telescopes to look at clouds of gas known as nebulae in our Milky Way discovered simple molecules formed by the combination of hydrogen and oxygen. Different kinds of molecules including water were soon detected together with other complex substances in these gas clouds suggesting, very forcibly, that the basic material for organic evolution exists in space.

Another part of the story emerging from the work of other groups of astronomers shows how planetary systems like our own solar system can evolve from these gas clouds, and these planetary systems should be a common feature of the universe. Hence the discovery of complex molecules essential to organic evolution in nebulae from which stars like our sun can be born has been a stimulus to those looking for evidence of extraterrestrial life on associated planets.

Sir Bernard Lovell said: "My personal judgment on the worthwhileness of such effort with our present equipment and understanding of the problem is reserved." His concern is with the more opportune and practical issue of the ex-

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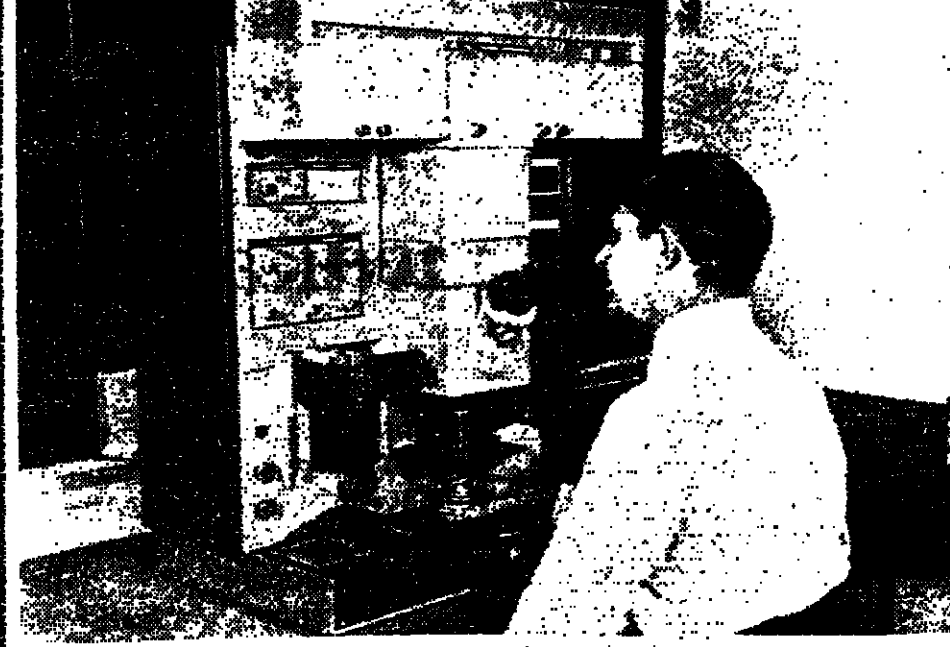
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(Left) The Interferometer and Scanning Microdensitometer, a new Vickers instrument which recently won a Design Council Award.



(Top right) The Vickers Interferometer and Scanning Microdensitometer, a new Vickers instrument which recently won a Design Council Award.



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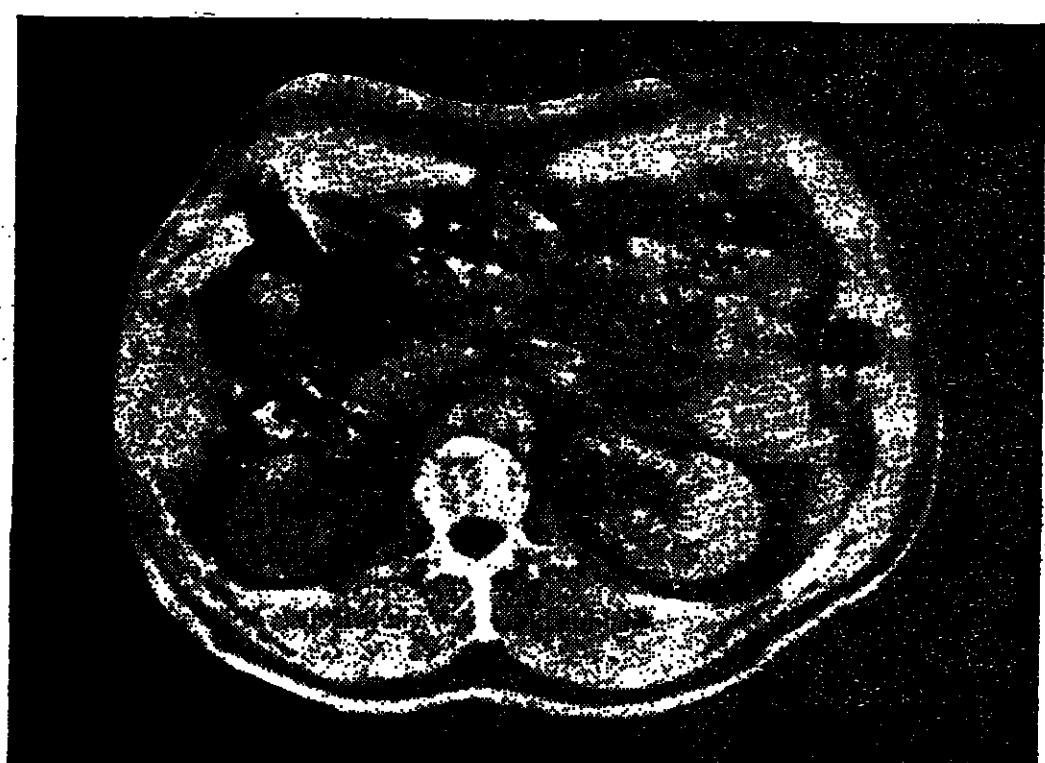
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Rift between research and teaching

by Pearce Wright

Almost all the questions of most interest to speculative minds are such as science cannot answer, and the confident answers of theologians no longer seem so convincing as they did in former centuries. This observation by Bertrand Russell in the *History of Western Philosophy* was followed by an avalanche of questions. Is the world divided into mind and matter and, if so, what is mind subject to matter, or is it possessed of independent power? Has the universe any unity or purpose? Are there really laws of nature or do we believe in them only because of our innate love of order? Is man what he seems to be the astronomer, a tiny lump of impure carbon and water crawling on a small and unimportant planet? Or is he what he appears to Hamlet? Is he perhaps both at once?

Quite clearly the modern scientist makes no pretence that some sudden breakthrough in research may occur to give an insight into questions which are as old as philosophy itself. However, there are other issues of great interest for speculation, even if the topics do not have the cosmic scale of Russell's inquiry. Indeed some people may well argue that to bring relief from disease, hunger and poverty through research in medicine, agriculture and social sciences provides a more direct insight into the philosophy of understanding human kind.

The man in the street is keenly aware of some inadequacies reflected by our inability to cure cancer and arthritis, or to devise materials for industry to resist corrosion and fatigue. So there is an enormous range of research to be done. The difficulty comes in deciding how to allocate limited resources to cover the essential topics.

Universities are the training ground for nearly all research workers, even though the research carried out by a graduate may ultimately be in an industrial laboratory or research institute instead of a university department. However, the fundamental studies conducted at universities provide an important element in teaching and maintaining a vitality in higher education. The two activities of research and teaching are intended to be mutually self-supporting. This long cherished belief of universities founded in the ideal, but the concept has stood the test of time well.

With the increase in universities and polytechnics some severe problems have arisen in maintaining the ideal of research and teaching going hand in hand. There is not enough money to support more than a fraction of research proposals, and those responsible for allocating money for research have a policy of selectivity in choosing where to give grants.

Should any of this be of more than passing interest to the non-academic, provided someone accounts for the public money spent? In my view the answer is "yes" because the academic world provides the last truly independent source of informed opinion. This is the opinion to counter committed views of government and industry on environmental issues of the environment and public safety as well as politics and social affairs. Is there a more compelling reason for sustaining the present scheme?

Universities face many conflicts

The money spent on university research is only a fraction of that allocated to government laboratories and industry, and the amount for defence research dwarfs everything else. Receiving the smallest share of the cake, the universities face many conflicts in deciding which research to encourage.

Funding of university research starts with the Department of Education and Science, which distributes money two ways. Grants are given through the University Grants Committee for capital investments. The five research councils are voted a science budget which has risen from £54.5m to £170.9m in the past 10 years. The research funds are distributed between universities as grants of a long or short-term nature, research contracts, postgraduate studentships and fellowships, the provision of certain large research centres used by universities as a national service and contributions to large international centres like the European Centre for Nuclear Physics (CERN), near Geneva, and the European Space Research Organisation.

lashed under the Science and Technology Act in 1965—the Science Research Council, Social Science Research Council and the Natural Environment Research Council.

The purpose of them all is to foster research and postgraduate training in specific areas of national and scientific importance, to encourage the intellectual development of sciences as such, and to maintain a fundamental capacity for research.

The decision for direct support by a research council to a university or polytechnic starts with individual academics or groups of staff who submit applications for grants. The successful proposals are selected on an assessment of merit, timeliness and promise as judged by the academic's peers who constitute the board's working groups and committees of the council. Inevitably, there is periodic criticism of some choices.

Criticism often comes at this stage from a disappointed scientist, or a college when an application is rejected. The charge is simply that university departments with members sitting on committees judging research applications do far better than anyone else. A suggestion to overcome this has been made to the select committee inquiry on research. It is that not more than a third of the members of a grant-awarding committee should have sat on it before and a third of the members should be non-professional.

the academic side control engineering, utacting on the main it this year and the Science Research Council shows a drop in vision for nuclear and an increase in nomy, space and search. In part thi an intention to good international opportunities through the Europ Research Organiza

The Agricultural Council is unique: councils in that w more than 40 years was in existence of private institut university groups recruitment aid. All amount of rese development has enormously, the money is still spe this network of 1 to which other s have been added only 6 per cent of spent on agricul goes to univer pared with more cent on the en directed research

Involvement wies by the Medic Council varies a more than 60 r support is concen universities or I verty instituti which have med Departments wir ingly able scienti verty with f collaboration wi parments tend support. Thus genetics is con Edinburgh, Ox bridge and Lo that for applied is in Sheffield bridge.

The Natural Research Coun specific brief t sciences of the through geology sics, of the se and biological c land waters ths and marine b the plant and of the land ths rial ecology atmosphere thin ology and physics. The Social search Council all the others i portant aspects built up a ne own institut. search propos through the u addition, the c nearly half it postgraduate i fellowships: a proportion of t the other cou ward this ac

Industry and academics must get toge

The economic health of the nation, in terms of developing science-based industries, modernizing existing industries and studying scientific management methods, depends on a good relationship between industry and the universities. Collaboration between the two is not always easy, and experience in Britain has been less fruitful than in the United States and Japan where great efforts are made to turn basic research into technological development.

An important attempt at better collaboration is being made with the building of the Cambridge Science Park, a £550,000 Trinity College venture designed to attract science-based industry to the university environment. The object is to capitalize on the university's scientific skills, equipment, libraries and overall stimulation of ideas for applied commercial research as well as fundamental academic studies.

Four companies are working on a carefully planned site, on the northern edge of Cambridge, to develop a mixture of firms run by business-minded scientists and scientifically minded businessmen. Approaches to fostering industry-university cooperation will include the use of academic staff as consultants, the use of industrial scientists as lecturers and undertaking research on contract.

A great deal of joint work is in progress. Every university and large polytechnic in the country must have several links with commercial organizations. They range from schemes such as that devised by ICI, in which parallel work in very advanced biomedical topics and basic chemistry is supported in university departments and company laboratories, to a specific assignment from a small company to solve a corrosion problem.

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There are even fewer contacts with industry or staff with industrial experience in the remaining natural sciences like biochemistry, biological sciences and mathematics.

Among the social sciences the closest links with industry are through business management interest. Research directors, however, are not particularly interested in the social sciences and people in industry are not in agreement how research in social science can contribute to industrial activities.

The CBI/vice-chancellors study identified three forms of collaboration deserving special attention—consultancies, joint research and joint appointments. Whatever form a joint scheme took, they concluded that the main barrier to successful collaboration was the lack of time. Both sides were prepared to devote to the union.

Universities see an increase in consultation as the best way to improve mutual understanding. It is not so apparent on the industrial side that a demand exists for more university consultants. Experience in collaboration varies between countries.

Very close and successful schemes occur in Germany, Scandinavia and the Netherlands between industry and technology universities, partly because of the very high prestige attached to universities and partly because of a career structure which encourages movement of staff between the two.

Another difference between the two countries is the form government support takes for research in universities and industry.

In Britain, research associations, government agencies

and government laboratories are doing work that elsewhere would be done in universities.

One of the most serious criticisms from industry is that there are not enough graduates in engineering and that it does not get its fair share of the first-class graduates. An analysis of the output of universities confirmed that most of those with first-class degrees in class honours degrees in science stayed on to do postgraduate research but few subsequently entered industry.

That trend raises the obvious question of whether it reflects an attitude that industry is socially irresponsible or whether the main cause lies in determined effort within the universities to remain their best talent.

The CBI/vice-chancellors analysis of the situation suggests that applied research and development in industry is as intellectually stimulating as work in universities. The criticism is accepted, however, that industry often does not give the young graduate the responsibility which he feels capable of taking.

Perhaps the most serious gap between the industrial and academic was closed by an attitude survey among firms of their impressions of science and engineering graduates. About half of them thought graduates' ability to communicate both orally and in writing was unsatisfactory.

In fact, industrialists argue that an ability by the scientist to explain science to the non-specialist or layman will help to develop self-confidence, and is especially if a graduate is to be given responsibility early in his career. Another serious shortcoming among scientists, and to a less extent engineers, is ignorance of technological sciences. The subject is seldom taught outside engineering departments.

The part of the attitude survey directed to universities provoked some interesting comment. One question in industrial activities was a positive factor in considering staff for promotion. A total of 32 universities said it would be considered a factor, although several qualified it by saying it would be relevant for only certain departments.

Nine of the technological universities were in favour and one said it was "considered on an equal basis with published papers". A Welsh university said it was "one of four specific factors considered in promotion to

senior lecturer copies were 1 and 16 replies success in indus ties into accou sidering staff p

Joint activit industry raise issue with unive freedom to pu The issue can played because publish is part sibility expects academic who privileged society. Most take the view th always retain p publication, and of work for h necessary part cess.

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Why a code of practice is needed for genetic engineering

One of its last actions was the summer recess, government nominated a committee of experts to draw up a code of practice for the use of research into what is known as genetic engineering. The intention is to prevent a sudden rush into one of the new techniques in microbiology which individual genes are snipped out of simple organisms like bacteria and inserted into other organisms. The code is being drafted by a committee of experts, and it is expected that it will be ready by the end of the year. The code is being drafted by a committee of experts, and it is expected that it will be ready by the end of the year. The code is being drafted by a committee of experts, and it is expected that it will be ready by the end of the year.

There are, of course, laboratories working with highly dangerous specimens as a matter of routine in medical research. Perhaps the best equipped centre in the world for handling such biological agents is the Microbiological Research Establishment of the Ministry of Defence, at Porton Down, Wiltshire. Scientists there have investigated the most deadly viruses and organisms known. The methods and apparatus for some of their experiments are almost certain to become a standard for genetic engineering.

The ethics of research in biology and biomedical studies is not a new question, but advances in such things as birth control methods and organ transplants raise different issues. No new medical treatment can be introduced without going through a period of trial and experiment leading eventually to trials on man.

Such tests can never be done without an element of risk. Elaborate precautions are taken to show that drugs are safe and that an incident such as the Thalidomide one cannot happen again. Manufacturers are also expected to show that their compounds are as effective as they allege them to be. No one would take exception to that. However, it does mean that trials must be made not only on animals and in the laboratory but also on man—and on a large scale and at various stages of development.

Properly designed "double blind trials" which figure as a description in most papers published on drug research, must include people who are "controls". The control is given a placebo from which he will derive no benefit, other than perhaps a psychological one. Thus the essential activity of showing the effectiveness of a treatment is carried out, but a range of ethical questions is automatically raised.

One of the arguments justifying such trials for drug development accepts the notion of informed consent as its foundation. Exactly how that can be defined is another matter. To start with, it depends on the level of understanding of the people who are being asked to cooperate. The amount of detail which can be given about a test is almost certainly limited so as not to invalidate the investigation.

A different and more complicated set of arguments is provoked when the use of foetal material for research is proposed. At one level the subject is tied to new legislation in draft form on the protection of the unborn child. Without going into that aspect, it might still be worth considering why research

prize, Dr John Enders explained that human foetal tissue was essential in the breakthrough of the basic work. Moreover, in the subsequent trials of a purified vaccine, the placebo was critically important. The initial programme was for 30,000 children to receive a false injection. With the incidence of poliomyelitis of that time, at least some would die and others be handicapped. But the vaccine had to be tried for the first time in children who were well, and some had to receive the placebo. Most of the studies mentioned so far have considered foetal material as groups of cells obtained from an autopsy. But as the Thalidomide tragedy made clear to the public, the living foetus is a patient as far as the doctor is concerned. There are special circumstances in which the doctor has to try to treat that very special patient either to save life or to ensure that certain injury does not happen before birth.

New space probe leaves man behind

By putting observation platforms beyond the influence of the Earth's atmosphere, space exploration could liberate the astronomer from what he called peering at the heavens through the equivalent of a very dark and dirty glass. This is one issue on which a clear division exists in the scientific and space communities. Scientific satellites can be built for a small fraction of the costs of manned enterprises. And in the opinion of many scientists, unmanned craft can be built to do most tasks automatically, and perhaps more efficiently, than a man.

The group which manages the scientific spacecraft part of the work of the American space agency has launched the 300 craft into Earth orbit, including satellites for European countries and Canada. These orbiting satellites have discovered and mapped in detail the highly complex magnetosphere surrounding Earth and the effect of solar radiation of the ionosphere and atmosphere.

Other spacecraft placed above the obscuring curtain of the atmosphere have looked far into space to study infra-red, ultra-violet, X-ray and gamma-ray sources to learn more about the stars, galaxies, pulsars and quasars. Automated spacecraft have orbited Mars and have flown by Venus, Mercury and Jupiter, contributing to an understanding of those planets and why they are different from the planet Earth. Other far-ranging spacecraft have mapped the Moon in detail and observed the Sun and the solar wind from widely separated points of the solar system.

In the study of near-Earth phenomena balloons and sounding rockets have been launched from many sites all over the world to carry instruments to map a profile of the atmosphere, to collect evidence of particles bombarding the upper layers, and to look at stellar objects. With this intensity of activity the scientific experiments that began with landings on the Moon are sometimes overlooked. Yet a special Lunar Programme Office is responsible for continuing the collection and distribution of data from the experimental packages left on the Moon's surface by Apollo 12, 14, 15, 16 and 17.

The lunar office also has to coordinate the distribution of results from the principal investigators in a dozen countries who have examined lunar samples and analysed other data being transmitted back from the Moon. The curator of the lunar samples at the Johnson Space Centre, Houston, stores and prepares samples of rock and soil returning in this exploration.

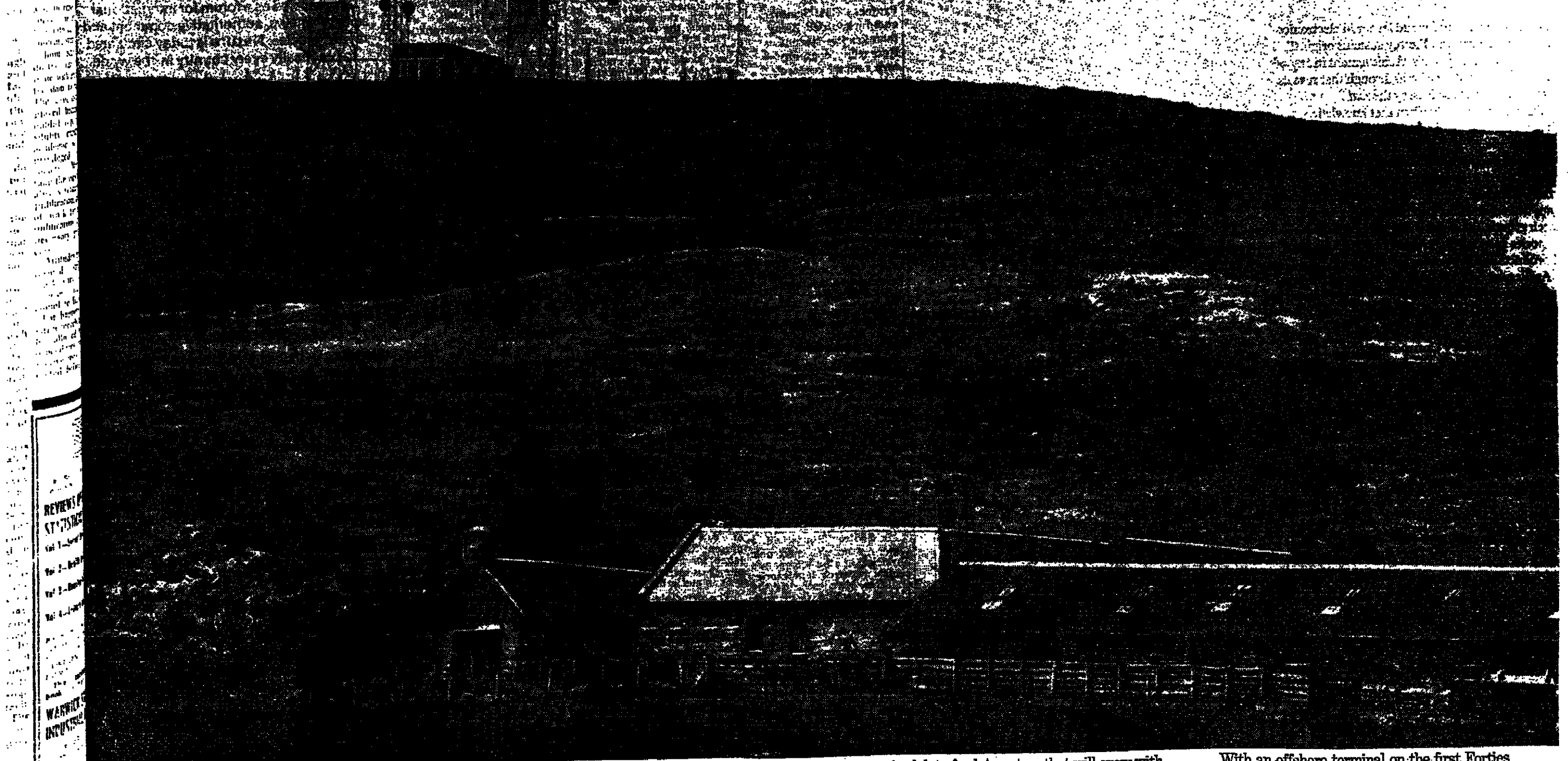
On reaching the planet the two vehicles are due to release two spacecraft which each is carrying—one for making a landing and the other for continuing in orbit. Thus an automatic laboratory would be placed on two sites on the planet and each site would be monitored by its sister spacecraft in orbit. The lander and orbiter concept is the same as that used for sending the first scientific expedition to the Moon. Results from the automatic stations provided the data by which the later landing sites for the manned Apollo craft were chosen.

Enormous differences have to be taken into account in preparing for Mars. The journey takes almost a year and the radio transmissions over such a great distance produce special problems. Information is sent back as a series of coded pulses—even pictures are relayed as a train of these pulses, which are reassembled in a computer before being shown in this exploration.



A special unit at the Microbiological Research Establishment, Porton, for the safe handling of virulent and dangerous bacteria. Right: Ariel V, Britain's fifth scientific satellite in the Anglo-American collaborative space programme, undergoes balance tests in the Science Research Council's laboratory at Appleton, near Slough. A model will be on display at an exhibition of research council projects opening tomorrow at the University of Surrey.

Space Link-North Sea.



Four platforms installed in under a year! Drilling in progress from one and due to start from a second this Autumn to bring oil ashore later this year. Ultimate production: 400,000 barrels a day from the Forties field through 107 miles of submarine pipeline and 137 miles of landline to Grangemouth Refinery, the Dalmeny tank farm and the tanker terminal on the Firth of Forth. And the vital link in this great production system—communications. Talking to North Sea production platforms is as simple as picking up the telephone but this hasn't

always been the case—the same conditions that make it difficult to get oil out are equally tough on communications. And the North Sea is not only rough, it has difficult atmospheric conditions and it's crowded. Crowded with wavebands. Rigs have to talk to other rigs, to helicopters and to supply ships, as well as to shore bases. Information and news is passed along. Emergencies reported. All this means we need an independent communications system capable of both voice transmission and

computerised data feed. A system that will grow with the industry until we can eventually control totally automated platforms from shore. The first offshore non-military application of a tropospheric scatter radio transmission system in British waters is BP's answer. The system sends out a narrow radio beam from a land base at Brimmond Hill, near Aberdeen. The beam travels just above the earth's curve and some of the energy bounces back off the troposphere, where it's collected and concentrated by aerials,

With an offshore terminal on the first Forties field production rig, it initially has 24 telephone channels which can also carry data at a rate of 2,400 bits per second per channel. A second 'tropo' link is scheduled for our next production platform in the Forties, using the same scatter beam. The complete Forties communication system costs about £1.5 million, but it's cheap at the price.

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- * Experience in mechanical and electrical engineering on a practical basis is essential. Equally important, familiarity with cryogenics and vacuum techniques and a knowledge of data acquisition and handling. Used to working in a research environment for several years. Knowledge of French desirable but not essential. Training will be given.

Salary: Between FF 3,500 to 4,100 according to experience and qualifications, plus 8%-10% expatriation allowance according to family situation. General installation allowance, superannuation scheme, reimbursement of travel and removal costs.

British Rail Engineering Ltd., Swindon Works, Swindon SN1 5BW. Tel.: Swindon 26222. Extn. 25. and should be returned not later than 26th September, 1975.

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Future for plastics is comfortable

Company: Hille International.
Project: polypropylene chair programme.
Research: Shell Chemicals, Hille, GPG, GKN.
Testing: Furniture Industry Research Association.

In the use of plastics in furniture the polypropylene chair programme begun by Hille in 1963 is recognized as a classic series. Designed by Mr Robin Day, design consultant to the company, the range is being extended next month with the introduction of a new indoor/outdoor chair for hot climates.

Throughout the programme a close collaboration in research, development and production has been maintained between the material supplier, the furniture company and its designers, the toolmaker and the moulder.

The commercial development of polypropylene dates from 1954 when Professor Giulio Natta, using organometallic catalysts similar to those developed earlier by Professor Karl Ziegler, produced polymers of propylene with useful properties.

For their work on catalysis and polymerization, which has had a profound effect on both the plastics and synthetic rubber industries, Natta and Ziegler were jointly awarded the Nobel Prize for Chemistry in 1963.

Polypropylene is one of the family of polyolefin plastics and was introduced to Britain by Shell Chemicals in 1958. It is a tough, resilient material which can be processed by normal thermoplastic techniques such as injection moulding.

Two main types of polypropylenes are available, homopolymers and copolymers. Copolymers have a higher impact strength and are slightly less rigid than polypropylene known as "Katalor" which is used by Hille for their new Polo chair.

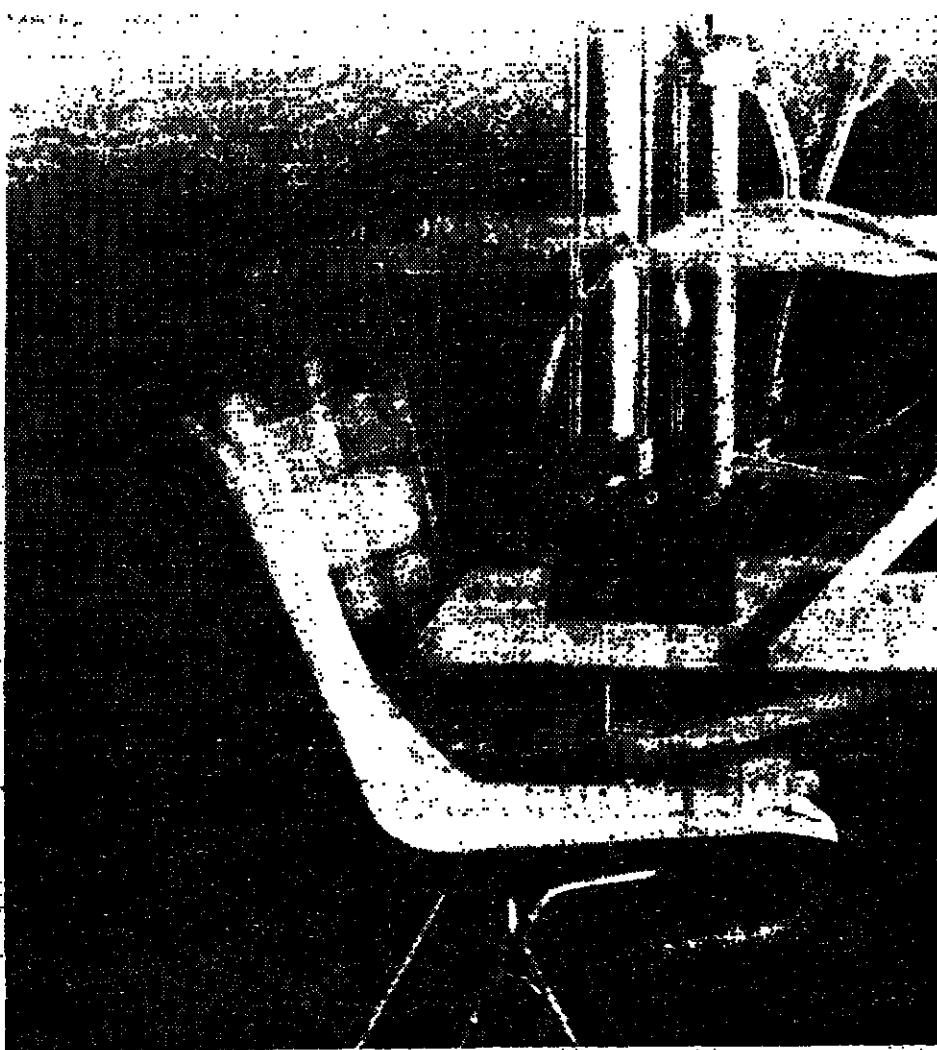
Testing, testing... a Hille chair takes a pounding as part of the development programme.

The birth of the polypropylene chair programme was an angle at which the material was injected into the mould. For example, could have a substantial effect on the appearance and strength of the finished product.

That type of development was very much a matter of a group of individuals' knowledge, rather than the product of a large company research department. Hille has no research department other than that carried in the heads of Mr Leslie Julius, company chairman, and Mr Day.

Certainly the "development" part of research and development is a large part of the furniture designer's work, and his work is important to the plastics company's scientists.

Just as the characteristics of the basic material are the result of Shell Chemicals' research, so the development of the moulding process to produce the required seat for the chair is the result of the designers, the material suppliers, the toolmakers and



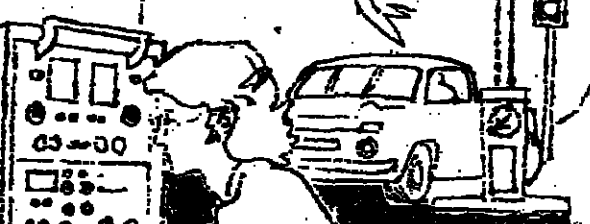
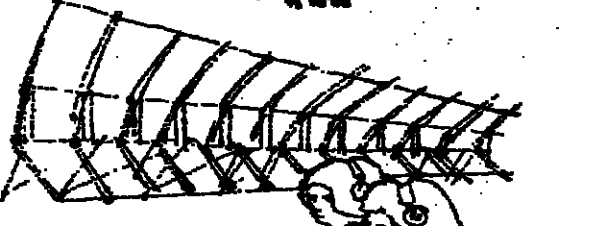
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Revolution in X-ray diagnosis

Company: EMI.
Project: EMI-Scanner computer-aided X-ray tomography system.
Research: company's own central research laboratories.

A completely new development in X-ray diagnosis has led to the successful introduction of a brain examination system which, compared with conventional radiology, gives much greater accuracy and is more comfortable and safer for the patient.

"This new radiological method", the *British Medical Journal* reported last year, "is revolutionizing investigative neurology and ophthalmology".

More recently the same principle has been applied in a system which gives similar advantages in the examination of tissues in other parts of the body.

The EMI-Scanner stems from basic research carried out in 1968 by the company into pattern recognition and data-retrieval methods. An optical scanning method has been devised for recognizing printed characters, and the possibility of applying this in other areas was examined. One such area was that of diagnostic radiology.

Mr Godfrey Hounsfield, a senior research electronic physicist at the company's central research laboratories at Hayes, Middlesex, had the idea of detecting X-rays with a crystal instead of film. It had been known for many years that certain crystals emitted visible light on exposure to X-rays, but this had never been exploited in diagnostic radiology.

In the words of the *BMJ* report, "Hounsfield postulated that by scanning a patient with a narrow beam of X-rays and a detector crystal in such a way as to allow a computer to extract the maximum amount of information from the detector readings, he would be able to build up a picture in which the grey levels could be calculated to a degree of accuracy 100 times greater than could be achieved in conventional radiology".

In essence, the system examines the brain in a series of thin, cross-sectional slices. For each slice, the X-ray tube and detectors traverse linearly across the

patient's head in 240 steps. This is then repeated at one degree intervals as the system is rotated through 180°.

The detector readings of X-ray intensity are fed continuously to the minicomputer which is an integral part of the equipment. By solving literally thousands of simultaneous equations involving thousands of unknowns, the computer translates the raw readings into a complete cross-sectional picture made up of a matrix of more than 100,000 points.

This is a vast improvement in accuracy compared with conventional techniques using X-ray film, which can differentiate only between large differences in density—between bone and blood or fat, for example, but not (without the painful injection of special substances) between the different types of tissue within the brain.

Two key elements in the success of the scanner were the original idea, and the power of the minicomputer, which enabled the thousands of readings to be processed rapidly. Once experiments had confirmed that Hounsfield's idea was basically sound, the task was then painstaking application of existing science and technology to the many problems which remained before a usable system for hospitals could be developed.

Accuracy and more accuracy, in measurement and positioning and control, were at the heart of this development. Continuous refinement of the mechanism of the scanner was demanded, together with extensive development and checking of the computer software.

Resolutions of the scanner were improved from a matrix of 80 x 80 elements to the present 320 x 120. The time taken for a full exposure of one cross-section of the brain is four and a half minutes.

The principle of the scanner was clearly applicable to the X-ray examination of various parts of the body. However, the brain scanner was developed first for two main reasons. First, the problem of body movement was not great; second, the scanner's ability to show subtle variations in tissue density in a painless process offered outstanding benefits compared with alternative techniques.

In moving to the body scanner, the EMI researchers have developed a system which rotates in 10° steps and takes only 20 seconds to complete a single-section full picture.

Accuracy of measurement is here an even bigger problem, since the variation in density from air around the body to the bone is about twice as great as in the brain scanner, where the head is surrounded by a water-filled cap.

Punctures sealed and healed

Company: Dunlop.
Project: Denovo wheel and tyre.
Research: company staff, and Industrial Unit of Tribology, Leeds University.

A major advance in motor safety and convenience was provided by the introduction of the Dunlop Denovo wheel and tyre, which enables drivers to continue driving up to 100 miles at 50 mph after a puncture. Company research and development leading to this innovation was supplemented by work at a specialized, university-based industrial research unit.

One of the key design features of the Denovo tyre is the use of liquid lubricant inside the tyre. This acts not only as a lubricant but in a number of other important roles; its development owes much to the skill of specialists at Leeds University.

Much work on the theory of elastohydrodynamic lubrication—relevant in understanding the "aquaplaning" effect of tyres on wet roads and runways, for example, has been done at Leeds. Duncan Dowson, Professor of Fluid Mechanics, is an acknowledged authority in this field; the Dunlop work was arranged by way of a contract with the Industrial Unit of Tribology at the university.

A prime function of the lubricant is to lubricate the internal surfaces efficiently, to minimize the friction between the wall and the tread which would otherwise destroy the tyre if it were to be driven deflated over any distance.

The fluid in effect has to separate the two surfaces completely—giving what can be termed an "internal aquaplaning" effect. Second, sealing additives are used so that the lubricant will temporarily seal the vast majority of puncture holes.

Third, it was decided to flat running tyre (about 80°C) to vaporize volatile components added to the basic lubricant. This gave a partial reflation of the tyre.

A fourth function of the lubricant is to act as a heat transfer medium, whose high specific heat enables the rubbing and flexing surfaces to remain fairly cool.

All these characteristics had to be combined in a fluid which was not too expensive to produce, and was non-toxic and non-damaging to rubber, steel and skin.

Tom French of Dunlop, who with his colleagues Eric Mitchell and Reginald Edwards received the Mac-

Robert Award of the Council of Engineering Institutions for their Denovo development) identified four main areas in which the Leeds unit's work helped materially.

These were in determining: the final lubricant properties (albeit blended with volatile additives to provide vapour inflation); the type of lubrication actually occurring between the mating rubber surfaces; this involved determining the film thickness, surface damage effects, temperature at the interfaces.

Other factors were specific quantities of lubricant and volatiles required to cope with minimum running distances, to avoid lubricant starvation under all driving conditions, to make use of net cooling effect of released lubricant, and possible surfacing configurations of mating surfaces and effect of debris in the tyre on lubricant.

"Although ideally the internal mixture could operate permanently loose in the tyre," Mr French said, "in practice to avoid unwanted vibrational effects, it is necessary to retain material in a suitable sealed state."

"We have elected this partly by use of a gel sprayed inside the casing, and partly development of small canisters each holding 20 cc of liquid blown on a light harness is pushed on to one the divided wheel."

"The system is highly low cost, provides servicing and repair and is highly effective special percussion valve was designed to liquid under pressure geometric condition, the tyre loses air."

Successful development of the multi-purpose wheel/tyre combination was a key element in the design objectives whole. These objectives provide much vehicle control following sudden blowout or leak; then to provide motorist with a "guaranteed" mobility to continue journey safely with couple this 100 p. assurance of safe normal use with "safe" factor so t abuse of the deflating excessive or too-severe ing is not dangerous

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Attempts to overcome lack of rapport must be encouraged

by Pearce Wright

the leaders of the community in the officialdom. Mr. Udall's chief target was the National Academy of Sciences, the scientific organization with the highest reputation in America, created to serve as an official adviser to the Government. Like the Royal Society in London, the academy is described as a self-perpetuating society of "enclaves" for which each year elects a limited number of scientists to membership in recognition of outstanding work. Whereas the academy has

a formal voice, the advice to the British establishment through the Royal Society is given on a private, more ad hoc basis. Nevertheless, the same aura surrounds the two of them: that of providing independent, objective advice on controversial issues of "special moment" without yielding to political and commercial interests.

The reason for the attack on the American scientific community is examined in an investigation published earlier this summer in *The Brain Bank of America*. The author, Mr. Philip Boffey, is a science

reporter who has worked on daily newspapers and periodicals, including *Science*, the weekly magazine of the AAAS.

The questions that Mr. Boffey raises apply as much to Britain as to North America. Differences exist of worldwide concern: the responsibility in the United Kingdom does not rest with organizations directly comparable to those in the United States.

The National Academy of Sciences passes judgements on public issues—the safety and nutritional value of food, the effectiveness of medicines,

the feasibility of controlling car fumes, the disposal of radioactive wastes, or the threat to the ozone layer from aerosols and exhaust gases of high-flying supersonic aircraft.

Issues of this nature are of worldwide concern. A few opportunities exist for adequate informed public discussion in which laymen can hope to have any influence on decisions affecting their future. If the community tends to feel helpless in the hands of specialists, it is understandable.

Any effort to overcome this lack of rapport between science and lay opinion would be welcome. For this reason alone, the attempts of the British Association for the Advancement of Science to bridge the gap at its annual meeting this week at Surrey University must be encouraged. Like every organization which derives financial support from public funds, the British Association leans over backwards to avoid socio-political judgments.

Yet the subjects on which the public seeks informed guidance, such as the wisdom of supersonic aircraft, genetic engineering, test-tube

baby research, continuation of atomic research for military and civil nuclear power stations and the development of new types of industrial chemicals, touch automatically on sensitive issues. There is no point in marshalling the technical factors in an understandable fashion without providing the forum for debate.

In the early days of the nearly 150 years of its history the British Association thrived on controversy. Annual meetings were rustic, bustling affairs. But at that time they were one of the main platforms for original

contributions on discoveries in science. The foundations of most contemporary science, from Darwin on evolution to Einstein on relativity, came in for a battering.

Today the sciences are fragmented between many more disciplines, most of which have emerged only in the past 30 years. The presentation of new discoveries and ideas is made at first through the hundreds of specialist journals and societies that cover these subjects. As this pattern has developed, an organization like

the British Association, trying to span the whole of science, has become a place for reviewing trends.

Its most successful work has been the spread of ground of young scientists throughout the country and collaboration in science fairs. But none of these activities is unique or exclusive to the association, which is an organization run by its members for members. Thus the creation of any new role for the British Association depends on how strongly its active members believe they should examine issues of public interest.

Sandwich courses strengthen university link with industry

by Alan Cane

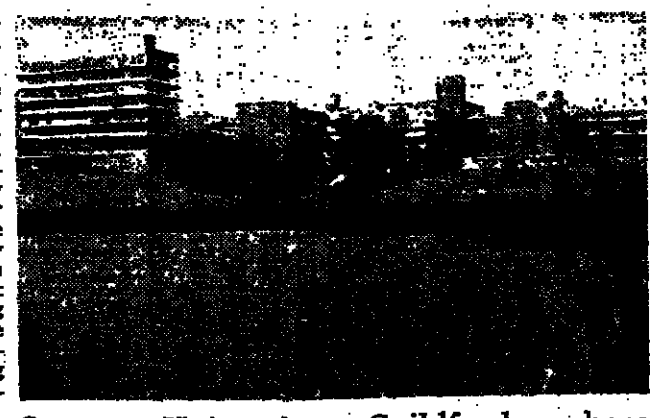
and industry cannot of the full-time student as a matter of population are taking sandwich courses. "The proportion has gone up steadily, and it is a trend which I hope will continue. I think it is a damned good thing, not right for every body, but for the majority of students it is right for two reasons: it provides the opportunity to see how academic theory is applied in practice; it is important psychologically that young people should see what life consists of and have experience of living and working with adults in an adult situation."

The university prospectus underlines Dr. Leggett's views, emphasizing: "We are firm believers in the sandwich principle and we believe there are few students who have not benefited immensely from a period of practical experience directly related to their studies."

Surrey specialises in the "thick" sandwich, which means that students take four years to complete their first degree, the third year of which is spent in industry. They get no state grant for that period but are paid by their firms—and they are expected to earn their salary.

Dr. J. George, senior industrial tutor in chemistry, says: "They can fairly be described as being of general degree standard and should be able to do a reasonable job of work and earn their salary. We ask that they are given a reasonably exacting job, are worked quite hard and are given some responsibility. They are employees and their work must genuinely be required by the company."

proportion has been growing much to the delight of Dr. D. M. A. the vice-chancellor, who takes great pride in the more than 50 per



Surrey University, Guildford, where the British Association is holding its 1975 annual meeting. A growing proportion of students takes sandwich courses.

Mr. Philip Allison, university careers adviser, says the failure rate in industrial placements is low, amounting to only a few cases in his experience.

"Thin" sandwiches are offered by 75 per cent of former CATs. They consist of six-month spells of academic and industrial work alternating through the four-year course. Surrey tutors believe this is a less effective system—by the time the student has settled in it is time to change stations.

A major advantage to the university of sandwich courses is industrial goodwill and sponsorship. Surrey has raised about £4m exclusive of grants from the University Grants Committee or the Science Research Council, and about £1,250,000 of that has come from industry. It has been a vital source of finance. The squeeze is on higher

education now, and the Government will give only a nominal sum for capital building programmes in the coming year.

Dr. Leggett says the university is fortunate in having buildings for all the students it wishes to care for; industrial money has gone into all the most recently completed buildings and has been Surrey's salvation.

There is also a valuable exchange of ideas between industry and the university, although it is less easy to measure: a fair amount of industrial research money finds its way into the university, but it would be hard to judge how that is influenced by the sandwich course programme.

Sandwich courses also help the university in student recruitment: "A number of people come here only because they have read about the industrial year in the

prospectus", Dr. Kenneth Stephens, formerly senior lecturer in electronic and electrical engineering, says.

For the industrial firm, the advantages are less clear cut. It may receive a nominal sum from the industrial training board for each student it employs, and it does get a year's work from a highly intelligent 20-year-old, but the chief benefit lies in improved graduate recruitment.

Mr. Hugh Jones, assistant personnel manager for Marconi Communications Systems, says: "The sandwich course people fit in better than orthodox graduates." It is clear that industries like to employ sandwich course graduates.

Mr. Allison says: "All the employers say that in comparison with most other students, sandwich course graduates seem more realistic and know what the world is all about. They are a lot more effective in interview."

Although sandwich courses were originally devised as an improved training for technologists, many people believe that students in the arts and social sciences would benefit from a professional year, and indeed at Surrey the sandwich principle can be applied to almost any kind of course offered by the university including linguistics and regional studies, hotel, catering and tourism management, humanities and the social sciences and music in addition to the more orthodox scientific options.

The chief difficulty and disadvantage of sandwich courses is that they are tied to the fortunes of industry and when these are low, as

continued from first page

for a deeper understanding of the processes of evolution within our own system. The possibility for these investigations by close inspection or contact with the planets occurred as soon as the Russians launched the first Sputnik. Familiarity with subsequent enterprises should not be allowed to obscure the magnitude of their achievements.

Tantalizing questions arise about whether there has been any kind of organic evolution elsewhere in the solar system. Is Mars really in an ice age and, if so, has any kind of primitive organism evolved during its favourable epochs when water flowed in the sinuous valleys photographed by spacecraft? Why did Venus and Earth, differing only slightly in size and mass, and moving in reasonably similar orbits around the sun, pursue such radically different evolutionary paths? The answers are vital to exobiology.

Astronomically, there is compelling evidence that the solar system is not unique. But do the recent discoveries about Mars and Venus indicate that the environment to support life is so extremely sensitive that conditions suitable for evolution are improbable even in a billion planetary systems? These questions are posed at an exciting stage in the plans to explore the planets.

He believes an almost non-existent dividing line separates activities which could produce the greatest human disaster or mark a profound intellectual advance in the development of civilization. He also believes the deeper ambitions for the understanding of human purpose no longer exert such a dominating influence on our lives as they did for our forefathers.

Throughout the whole of recorded history a consistent thread has been the intellectual purpose of man to discover the nature of the universe.

Today we refer to this as the cosmological problem, that is, how did the universe come into existence and what is its future? Hitherto man has attempted to give either a theological answer or to believe that the solution would be discovered by scientific observation alone.

The contemporary argument whether the universe ever did have an origin or whether it is, and always has been, in a state of continuous creation has been clarified. But this has brought an imponderable conceptual difficulty. The observational evidence of astronomy—and

Man's role 'in the centre of Immensties'

continued from first page

idea of a principal fireball in the universe.

The great difficulty is that, by applying the laws of physics as we understand them, unsatisfactory predictions are obtained about conditions before the expansion occurred. It is all very embarrassing for science because the great achievements of observational astronomy and theoretical physics have separately led to an impractical description of the initial state of the universe.

The unusual state predicted is one of infinite size and density; the change from the infinities of density and size at time zero to the finite quantities encountered by the laws of the physical world we know, may lie beyond scientific comprehension, Sir Bernard suggests.

He argues that man may have missed out his own connexion with the universe of atoms, stars and galaxies. One second after the beginning of the expansion of the fireball, when the temperature had fallen to a few thousand million degrees, there was a critical period which determined the ultimate abundance of helium and hydrogen in the universe.

He considered the tiny difference in conditions which would have turned all the hydrogen into helium at this early stage of expansion. No galaxies, no stars, no life would have emerged. The existence of a remarkable and intimate relationship between man, the fundamental constants of nature and the initial moments of space and time, seem to be an inescapable conclusion.

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BY THE FINANCIAL EDITOR

Reinforcing cash flow at European Ferries

As well as double-locking the door against any predators, the European Ferries rights issue, being done on a one-for-two basis at 25p, should effectively remove most of the remaining subsidies as to the future liquidity pressures. The £5.9m being raised admittedly does not reduce the high gearing ratio by any appreciable amount but it should be a valuable reserve in case there is any shortfall in cash flow required to meet the £23m of loans due for repayment within the next three years.

Certainly the interim results and even more so the forecast for the full year go some way towards dispelling this eventuality. With the aircraft operations now out of the way—last time these made losses of £607,000—it seems plain sailing for the remainder of this year. Cross-Channel traffic is up 23 per cent this summer with Townsend-Thoresen having the lion's share. So the forecast of an improvement in the pre-tax total from £4.2m to around £5m could well prove somewhat conservative.

The strongest support, however, lies in the wowed depreciation on its ferry fleet totalling about £50m and sufficient to contain the tax charge to minimal proportions until the 1980s. This provides a considerable incentive to banks to buy and lease back ships—one such plan involving £5m or so is currently on the stocks and would provide additional liquidity for European Ferries. The fleet itself is an appreciable asset against sterling depreciation, helped by its comparative newness.

That the issue has not been underwritten comes as no surprise with the rights being worth 13p a share and an almost captive 62 per cent of the equity held by individuals who can participate in the concessionary fares. The yield of 5.5 per cent on the ex-rights price is not compelling but the shares, closing last night at 64½p, carry above average defensive qualities.

Interim: 1975 (1974)
Capitalization £32m
Sales £24.1m (£19.4m)
Pre-tax profits £2.03m (£1.25m)
Dividend gross 0.92p (0.82p)

Associated Dairies

Strong rise in volume

Associated Dairies did not spoil the initial impact of its amazing second half advance with any details of exceptional items that pushed up the earnings increase. Working from the group's own figures, that take in, for instance, the benefit of an extra £350,000 in milk rebates and an extra week (the latest reported year ran for 53 weeks) we have sales up by 39 per cent against an unadjusted 52 per cent, and pre-tax up by just under a third against a stated advance more or less in line with turnover.

That said, there is still a good deal of healthy progress evident in the figures. Associated Dairies puts it down to substantial volume gains in the final half of the year—with the sales split fairly evenly between real and inflationary growth. Square footage has increased with openings totalling a half-a-dozen for the full 12 months, but the group is claiming that the first-half openings made only a marginal impact in the second half, and that the group's older stores were closing up the real gains—and here the volume was such that a great deal of the gross was going straight through to the net.

But it is questionable whether the group can keep up this pace in the current year. The fixation with the £6 annual wage increase is going to bear very hard on the retailers, particularly the lower margin ones, at one end, while there is evidence that consumers are going to trade down in a big way as life gets a little tougher. At 181p the shares are on a high,



Mr. Gerald Mobbs, who is to retire as chairman of Slough Estates next March: benefiting from the rights issue.

and possibly vulnerable racing with a P/E ratio of 14 and a yield of 1.2 per cent.

Final: 1974-75 (1973-74)
Capitalization £63m
Sales £221.3m (£158.2m)
Pre-tax profits £9.88m (£7.41m)
Earnings per share 12.97p (9.70p)
Dividend gross 2.23p (2.02p)

Johnson Matthey

The downturn intensifies

Johnson Matthey had turned down by 17 per cent in the final quarter of last year and the talk in the annual report was of it being "inescapable" that profits would be reduced while the present recession lasted.

The first quarter stage that has worked through in the form of a drop of 37 per cent, and for the moment it is hard to see what can buoy up the shares, 7p lower last night at 245p, almost 70p below the level in June when the full year figures were announced.

Clearly it has been extremely difficult for JM to insulate itself against the problems besetting its major industrial customers, and excluding the banking division, sales were down from £85.4m to £68.3m. In the meantime, the three months since the year-end have seen loans creep up by close to another £2m to £29.4m.

The question for the moment, then, is how far the first quarter still sees JM on the downward path. With the gold and silver markets proving themselves to be short on excitement at present it is hard to see much by way of support from the dealers in the business, and there cannot yet be much of a case for the shares until the real severity of the downturn is clear.

1st Quarter: 1975-76 (1974-75)
Capitalization £42.1m
Sales £68.3m (£85.4m)
Pre-tax profits £2.81m (£4.44m)
*Excluding JM Bankers.

Pearl Assurance

Problems with motor account

Pearl's motor insurance experience has persistently been worse than that of the larger composite groups and has deteriorated even further in the first half of 1975. That is what is behind the rise in the underwriting loss from £1.19m to £1.36m over the period, despite an improvement in the aggregate account. Small wonder then, that Pearl is now talking of quarterly rises in its motor rates and setting that trend with October rate increases to follow those in June.

With the aid of those underwriting losses for the year are forecast to be somewhat less than the £3.5m in 1974. Meanwhile the 40 per cent rise in investment income to £1.15m at half time (reflecting the 20 per cent increase in United Kingdom general branch premiums) suggests that the overall trading result this year may be considerably better than last year's loss of £1.24m.

There is little in this year's transfer to profit and loss account will be from the long-term insurance side. At least the rise of around a quarter in both ordinary branch and industrial branch new premiums is promising from the cash flow point of view. Whether the life offices can hope to continue showing capital appreciation and earning income on these new funds on the scale they have done over the past few years is open to question however. That may not deter policyholders over much but shareholders in the proprietary life groups, such as Pearl, have the option of switching into the composite sector now in order to benefit from the recovery in underwriting profits there. At very least they should look at yields in the life sector and here Pearl's prospective 7.6 per cent at 70p is hardly shining against, say that of 9.6 per cent on Refuge A at 195p.

Interim: 1975 (1974)
Capitalization £74m
Premiums written £12.9m (£11.58m)
Pre-tax loss £0.21m (£0.37m)
Dividend gross 5.38p (5.22p)

Slough Estates

Maintaining momentum

As the property industry swings between disaster and recovery Slough Estates comes up with consistently improving figures. The latest set, for the half-year to end-June, are accompanied by a confident forecast of year-end figures "substantially higher" than those for 1974, and a promise—all things being equal—of a maximum increase in the dividend for the year. All the same, the question now is whether or not to sell Slough's shares.

Yesterday they rose 1p to 79p, at which level they are showing no discount at all on the asset backing as revealed by the balance sheet. Granted, that is probably some 30p short of a realistic figure, since Slough is charging the interest on its United Kingdom development properties to the profit and loss account and did the bulk of its buying ahead of the peak in the property market; but even on that figure the discount is slight enough to suggest that Slough's shares have leant ground to make more than those of its competitors.

They also have less ground to lose than most of them. For in what is likely to be a very tough winter for the companies specializing in industrial property—which still have the worst of the property market to work through—Slough continues to benefit from the fact that a large proportion of its rents are linked to the wholesale price index. In addition the big gains on the ending of the rent freeze—worth £400,000 in the first half alone—have not yet come off until the end of the first quarter—have yet to come through.

Meantime the group's balance sheet, never highly geared, has benefited from the April rights issue of loan stock and a medium-term loan from FCI: there is relatively little development in hand in the United Kingdom, although there are plans to commence on the redevelopment of the Surrey site next year.

So the group looks set to maintain, though perhaps more slowly, its forward momentum, and the shares look safe but not, at the moment, interesting.

Interim: 1975 (1974)
Capitalization £72.1m
Pre-tax profits £2.35m (£1.94m)
Dividend gross 0.96p (0.87p)

Except perhaps to a few sceptical economists, the use of astrology might not seem to be very similar. At first sight one aspires to scientific exactitude and precision, while the other is based on hunch, speculation and a great deal of amateur psychology.

However, the two subjects do have some things in common. In particular, they both at times try to predict the future and both are usually rather unsuccessful in their attempts.

Economic forecasting has been one of the rare growth industries of these troubled times. No only have companies and financial institutions become increasingly interested in its output, but government departments have also felt obliged to set up distinct forecasting functions.

The Treasury, the powerhouse of British economic policy, has had a model since the early 1960s. It has had a computer, capable of solving large simultaneous equation systems, since 1968. Aided by this electronic gadgetry, the model has expanded at a far more spectacular rate than the economy it pretends to describe, and now consists of about 700 equations and identities.

But all is not well with the Treasury model. In the last five or six years the Government's handling of the economy has not been very happy and its public pronouncements on the future behaviour of major economic variables have been usually wrong.

The latest example has been politically sensitive and, for that reason, more than usually newsworthy. The pressure of demand in the United Kingdom will continue to rise for the remainder of the year, I must warn the House that it could be touching a million... by the end of the year, Mr. Denis Healey, the Chancellor of the Exchequer, in the April Budget speech.

But unemployment has misbehaved. It amounts to one and a quarter million on some definitions and, on the central definition used by Mr. Healey, seasonally adjusted for the United Kingdom, it reached 1,008,800 on August 11, several months before scheduled.

The abrupt and frightening change in labour market conditions has surprised the Government by surprise, embarrassed ministers and caused some red faces among Treasury officials.

The Government was given advance warning by independent forecasters. In early 1974 Professor David Layard, then of the University of Manchester Inflation Project, forecast a sharp rise in unemployment in 18 months' time. His colleague, Professor Michael Parkin, was more definite. Unemployment, he said, would reach one million by June, 1975.

The Treasury estimates, or, rather, "guesstimates"—of future inflation rates have been even more lamentable and the consequences have in some ways been just as disastrous. It has clearly been bewildered by the speed of pay and price increases since early 1974 and this has been the basic reason for runaway public spending and the present disarray in public sector finances.

But the Manchester economist said that 20 per cent inflation was inevitable some time before it happened. Professor Layard's evidence to the House of Commons expenditure committee on June 26, 1974, was quite firm on this point.

He said, "If the inflation rate stopped accelerating before mid-1975 on the basis of past form. That means the rate of inflation will be over 20 per cent as things are going now. I am not saying that it will be, but it is a possibility. It is a possibility which will be a powerful relationship. No one in the Treasury believes—or, at least, one hopes that no one in the Treasury believes—the interest rates and other financial factors do not affect housebuilding and investment."

The fact that relationships jump up and down does not mean that the relationships are not there or that the money doctrinal positions represented. Some officials may well have agreed with the Manchester economists' warnings when they were given.

But the fact remains that most officials did not, and that the Treasury as a whole was badly wrong.

What is the matter with its forecasting procedures? Is there some fundamental weakness in its approach or is the work on the right lines but incompetently performed?

The Manchester economists have one great advantage over the official model. They believe that "money matters" whereas most of the economists who developed the model regard money as an incidental extra to be ignored or remembered according to personal taste.

It is possible to find forecasters in the Treasury who deny any connexion between the 25 per cent rates of money supply growth in 1972 and 1973 and the 25 per cent rates of inflation found in 1974 and 1975. If one looked hard enough, it might even be possible to find forecasters who deny any connexion between the Barber money supply explosion and the property boom or the growth of secondary banks.

It may be that such events are too close to the real world to be of much interest to the Treasury. But official forecasters—and, indeed, private forecasters who also exclude monetary variables from their models—do deny their position.

They distrust of "monetarism" arises from a belief that it has only one equation, that which links the money supply and the money national income. For Treasury purposes such a narrow approach is not much help. The Government needs to know what the prospects are for the major demand categories of consumption, investment and exports and for scores of minor sub-categories.

When monetary variables are incorporated in a detailed model they tend not to be as efficient for forecasting as traditional variables and, indeed, "Keynesian" kind. The relationships between interest rates, for example, and housebuilding or investment tend to be volatile and unreliable.

They are not sufficiently stable for inclusion in a model which aims at exactitude and precision.

The "monetarists" do not dispute the variability of particular monetary relationships, although they insist on the central connexion between money supply and money national income. But they do not worry about it either.

Most "monetarists" reject the practice of "fine-tuning" the economy—that is, of trying to keep demand close to a hypothetical full employment level by marginal adjustments of government spending and taxation—as over-ambitious and basically misconceived.

They are also, on the whole, unenthusiastic about particular micro-interventions of the kind favoured by detailed forecasters. These are some of the ways "monetarism" coincides with a liberal approach to politics and economics generally.

It should also be said, at a more technical level, that the policy relationship, which still is a powerful relationship. No one in the Treasury believes—or, at least, one hopes that no one in the Treasury believes—the interest rates and other financial factors do not affect housebuilding and investment.

The fact that relationships jump up and down does not mean that the relationships are not there or that the money

supply can be pumped up at unprecedented rates without influencing economic behaviour.

Moreover, there are plausible explanations for difficulty in accommodating monetary variables into forecasts. Equations are stable if the behaviour they describe is stable and if the institutional framework around them is fairly continuous. But British monetary policy since the early 1960s has not created a continuous institutional framework.

On the contrary, policy has been adorned by a succession of "ceilings" on lending and directives on credit priorities. These inevitably upset the equations even if the underlying behaviour is stable and the responses of firms and individuals to financial signals are regular and systematic.

In any case, to recall an old dictum, it is better to be

roughly right than precisely wrong. Precise models without money seem to have been badly wrong in the last two or three years, while rough models with money seem to have been more or less right.

The growing dissonance with the full-blown several hundred-equation system type of forecasting has encouraged interest in a less formal, but much more pragmatic and simple, approach. This relies on the use of certain statistical series as predictive tools. Indeed, the Central Statistical Office has developed the technique and begun to publish the results in its monthly *Economic Trends*. These consist of four categories of indicators—two indices of leading indicators, one of coincident and one of lagging.

If the index of leading indicators goes up it suggests that the economy is likely to pick up in several months' time; if the index of lagging indicators goes up it suggests that the economy was approaching a peak several months ago.

If full-blown computer forecasting has pretensions to being a science, leading indicator forecasting is very definitely an art—above all, an art of selection and emphasis. It is essential to select about 10 indicators which give a good guide to the way the economy is moving and to accord them the appropriate relative emphasis. Both selection and emphasis are improved if they spring from an integrated and complete theory of "how the economy works."

This is where "monetarism" or, at any rate, a belief that monetary and financial variables are crucial to economic behaviour, scores well. The four components of the first CSO leading indicator index are: the number of housing starts, the rate of interest on three-month bank bills, the corporate sector's acquisition of financial assets and the *Financial Times* ordinary share index.

It is striking that all four are monetary. The significance of monetary policy could hardly be more spectacularly confirmed.

The same is true, though to a slightly lesser extent, of the second leading indicators index. This is influenced by a number of variables—the total increase in hire purchase debt, the number of insolvencies, wages per unit of output and new car registrations. Of these only one, wages per unit of output, is not directly affected by credit conditions.

A "Keynesian" forecaster would have great trouble fitting the success of these monetary variables into his worldview. To him the ups and downs in economic activity

depend on a highly restricted range of "exogenous" variables, primarily world trade, public expenditure, tax rates and incomes policies.

Indeed, the success of monetary variables in the leading indicator approach surely casts doubt on the validity of a several-hundred equation computer approach which excludes them or refers to them only peripherally.

Interest in the leading indicator approach is likely to be furthered by a book, *Cyclical Indicators for the Postwar British Economy*, by Desmond O'Brien, published last month as a special paper for the National Institute of Economic and Social Research. It is particularly notable because it has come out under the aegis of the National Institute, a bastion of Keynesianism and the home of one of the biggest computer models in the United Kingdom.

A finding of the study is that the level of share prices is one of the best signals of future economic developments. A number of indicators are awarded points according to their frequency and consistency in preceding changes in output and employment.

The *Financial Times* dividend yield and ordinary share index achieve some of the highest points totals. Other high scorers are the balance of payments, the price of raw materials purchased by industry, and the Confederation of British Industry survey of business opinion.

The level of share prices depends crucially on the conduct of monetary policy. The automatic reaction of any stock exchange in the world is to lower prices after an officially induced increase in interest rates.

It is very difficult indeed to see how a conventional forecaster can both agree with the conclusions of leading indicator studies and believe that monetary policy is of little relevance to economic performance.

However, the National Institute and, no doubt, the Treasury are not especially concerned about the efficiency of monetary variables as predictive tools. Indeed, the National Institute is considering the preparation of its own leading indicators index to be published alongside its standard forecasts. It seems unlikely, all the same, that the civil servants, who will be starting to look at the level of share prices to help them in the formulation of policy.

Unless, and until, conventional models incorporate monetary variables they will fail to capture some of the most important influences on the level of growth and employment. Instead, the models will have, to rely, as they do now, on assumptions, mostly political assumptions, plucked out of the air.

The people who construct them will continue to see inflation as determined by erratic changes in the community's level of greed and envy (or "union militancy") and will put by violent and inexplicable swings in business optimism.

In short, until forecasters accept that "money matters" economics and astrology will have much in common, because, as laymen may have conjectured, both are based on hunch, speculation and a great deal of amateur psychology.

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